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(71) Applicant: PI ELECTRONICS INCORPORATED [US/US]; 9777 West Gulf Bank Road #5, Houston, TX 77040-3113 (US).

(72) Inventors: GIL, Asher ; 5922 Pine Arbor, Houston, TX 77066 (US). DARON, John, B. ; 9006 Arbor Wood, Houston, TX 77040 (US).

(74) Agent: TOEDT, D., C., III; Arnold, White & Durkee, P.O. Box 4433, Houston, TX 77210 (US).

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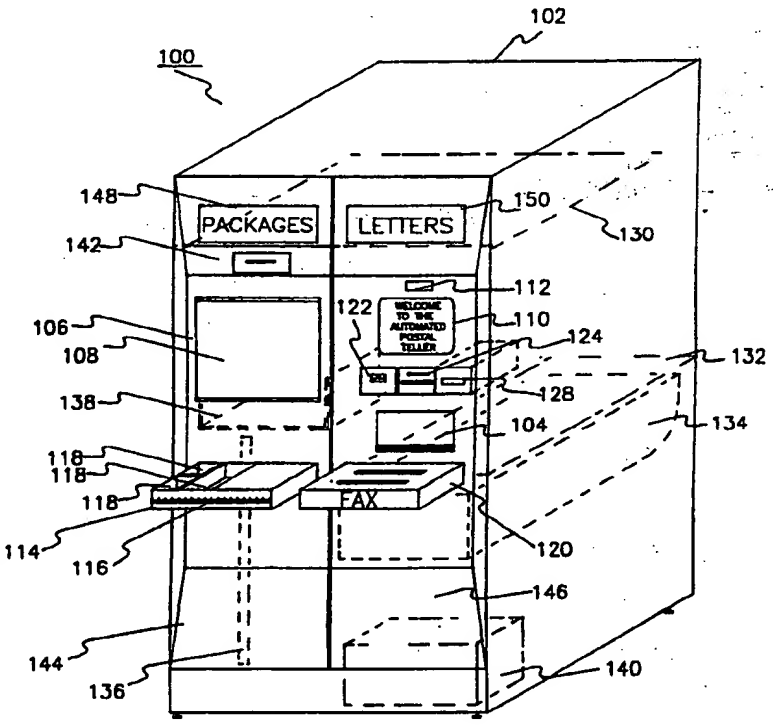
(54) Title: AUTOMATED SELF-SERVICE PACKAGE SHIPPING MACHINE

(57) Abstract

A self-service apparatus (100) capable of automatically handling envelopes and packages through various stages of processing, including touch screen (110) to handle various inputs from the customer, digitized voice (112) to prompt the customer and instruct him in the processing, electronic weighing (138), electronic printing (142) of the ZIP+4 barcode, electronic printing of the shipping label (140), electronic printing of the receipt (128), electronic printing (140) of the manifest documentation for both the letters and packages, and maintaining of the manifest documentation for both the letters and packages. Mailing charges are deducted from a prepaid magnetic card through the use of a magnetic card reader (122). Maintaining postage and shipping rates, ZIP+4 CD-ROM directory in order to locate the ZIP+4 information. A dual floppy disk system (124, 126) to allow the mailer to send electronic mail. A built-in facsimile apparatus (120) to allow the customer to send "FAX" information through the telephone line.



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AUTOMATED SELF-SERVICE PACKAGE SHIPPING MACHINE

The invention relates to automated self-service systems for receiving and initially processing letters and other packages for subsequent transportation by the U.S. Postal Service and/or private package shipment companies.

The Appendix sets forth copyrighted subject matter. No objection is made to reproduction of the Appendix solely in connection with reproducing any patent that may issue from this application, but all other rights under copyright law are reserved.

An automated self-service machine in accordance with the invention advantageously combines features of mailroom automation systems with features of bank automated teller machines. The machine may be located in post offices, convenience stores, and the like.

A notable aspect of the self-service machine is its user interaction. In operation, the machine conducts a dialog with a user/customer, via a touch screen and a digitized voice output (or other input/output devices), to obtain information about the customer's intended shipment address, class of service, and the like. The customer may specify, e.g., first-class mail, registered

or certified mail, and the like. The customer may specify a language (e.g., English, Spanish) in which he or she wishes to communicate. Certain dialog segments are color-enhanced, e.g., a green representation of a certified mail "green card" receipt is displayed on a color monitor to aid the customer in providing information about a certified mail letter.

The machine measures the weight and other dimensions of the customer's package; the measurement is performed automatically for packages whose dimensions fall within specified limits. Using these measurements and the customer-provided information, the machine computes the postage or other shipping charge. The shipping charge may include a fee charged by the owner of the convenience store or other machine location, e.g., to cover the overhead cost of having the machine on-site.

The machine obtains payment from the customer, notably through the use of a prepaid, low-cost charge card which may be sold in convenient denominations at the machine's location (e.g., at a convenience store). A magnetic card reader for handling such cards may be connected through a conventional interface directly to, e.g., a convenience store cash register. Alternatively, the customer may use a credit card to make payment.

The machine prints a routing/shipping label for the customer's package. If the package is a simple first-class letter, the label may comprise a postal bar code printed directly on the letter's envelope. The bar code may embody the nine-digit ZIP+4 code of the destination address, which may be looked up by the machine from a database in a CD-ROM disk. If the package is a letter to be sent by certified mail, the machine prompts the user to insert a U.S. Postal Service

certified mail "green card" blank form for printing. If the package is a box or large envelope, the machine may print a shipping or mailing label, including an appropriate routing/tracking bar code, on peel-off label stock; the customer may then apply the label to the package.

Prior to printing a shipping label or bar code, the machine may advantageously consult a directory (e.g., a ZIP+4 directory) to verify that the destination address specified by the customer is not obviously incorrect. Furthermore, the information obtained from the customer by the machine includes the customer's name, address, and telephone number, enabling the shipping company to contact the customer more readily if the customer's package cannot be delivered.

When the customer's transaction is complete, the labeled package is automatically received into a locked storage compartment in the machine. The storage compartment may be emptied at a convenient time, e.g., by a convenience store clerk, and its contents delivered to the U.S. Postal Service or other shipping company. A sensor detects when the storage compartment is full and alerts appropriate personnel.

A printer in the machine prints a customer receipt. The printer may be a thermal printer, and the receipt may be printed on aluminized stock, to reduce the chance of customer alteration of the receipt.

When a machine operator (e.g., a convenience store clerk) inputs an appropriate instruction at the "end of the day," a hard-copy manifest of packages received by the machine is generated.

The machine may be operated by a customer in an "Inquiry" mode. For example, a customer may use the machine simply to look up the nine-digit ZIP code for a particular street address. This feature may be provided free of charge as a courtesy.

Like reference numerals are used to refer to the same components and parts in all of the following Figures:

Figure 1 is a perspective view of an automated mailing apparatus in accordance with the present invention;

Figure 2 is a top view of the letter-handling system assembly of the apparatus of Figure 1;

Figure 3 is a top view of the apparatus of Figure 1;

Figure 4 is a front view of the apparatus of Figure 1 showing portions of a package tilting mechanism;

Figure 5 is a side view of the apparatus of Figure 1 showing portions of the package tilting mechanism with the package scale in the upright position;

Figure 6 is a side view of the apparatus of Figure 1 showing portions of the package tilting mechanism with the package scale in a tilted position;

Figure 7 is a side view of the apparatus of Figure 1 showing portions of a printer tilting mechanism;

Figure 8 is a side view of the apparatus of Figure 1 showing portions of the printer tilting mechanism when the printer is rotated to a fully upright position;

Figure 9 is a top view of the apparatus of Figure 1 showing portions of the printer tilting mechanism;

Figure 10 is a top view of the apparatus of Figure 1 showing portions of the printer tilting mechanism of Figure 9;

Figure 11 is a front view of a portion of the apparatus of Figure 1 showing the package acceptance door sliding mechanism;

Figures 12a, 12b, and 12c collectively comprise a block diagram of computer hardware in the apparatus of Figure 1;

Figure 13 is a diagram of the main electronics board of the apparatus of Figure 1;

Figures 14a, 14b, and 14c collectively comprise a schematic diagram of the control signal circuitry of Figures 12a, 12b, and 12c;

Figure 15 is a schematic diagram of the multiple-printer card 1258 from Figure 12c;

Figure 16 is an illustration of a silk-screen mask for PC board 1302 of Figure 13;

Figure 17 is a schematic diagram of the voltage-to-frequency weigh card 1202 from Figure 12a;

Figures 18a and 18b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in mailing a first class regular letter;

Figures 19a and 19b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in mailing a first class letter in "Sav-A-Day" mode;

Figures 20a and 20b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in mailing a first class, certified letter;

Figures 21a and 21b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in mailing a first class, registered letter;

Figures 22a and 22b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in mailing a first class, insured letter;

Figures 23a and 23b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in responding to a customer inquiry regarding first class mailing;

Figures 24a and 24b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in mailing a package;

Figures 25a and 25b collectively comprise a flow diagram illustrating operation of the apparatus of Figure 1 in responding to a customer inquiry regarding mailing of packages;

Figure 26 is a flow diagram illustrating operation of the apparatus of Figure 1 in printing packages and letters manifest;

Figure 27 is a data flow diagram for the control system of the apparatus of Figure 1;

Figure 28 is a data flow diagram for the first class mail subsystem of the apparatus of Figure 1;

Figure 29 is a data flow diagram for the report generation subsystem of the apparatus of Figure 1;

Figure 30 is a data flow diagram for the package handling subsystem of the apparatus of Figure 1;

Figure 31 is a data flow diagram for the machine control subsystem of the apparatus of Figure 1.

Referring to Figure 1, a self-service package shipping machine 100 according to the invention is shown. A letter-handling subsystem is shown on the right side of the machine, and a package-handling subsystem is shown on the left side. In the Figures, reference numerals are used to indicate components and parts as indicated below:

100 Zipster Plus ZP-3D Automated Mailing Apparatus
102 sheet-metal housing
104 letter acceptance slot
106 package acceptance window
108 package acceptance window door
110 touch-screen computer monitor, Carroll Touch Company, Austin, Texas
112 loudspeaker
114 work tray
116 ruler disposed on front of work tray 114
118 divided compartments disposed in work tray 114 for containing work supplies and preprinted USPS forms, Federal Express/UPS forms, and the like
120 fax machine
122 magnetic card reader, COPYVENDOR cardreader by McKey Inc., of Harleysville PA -

124 3-1/2 inch floppy disk drive
126 5-1/4 inch floppy disk drive
128 thermal receipt printer
130 dotted line denoting general area in which electronics are disposed
132 dotted line denoting general area in which letter-handling system assembly is disposed
134 letter tray
136 dotted line denoting general area in which mechanism for sliding window door 108 is disposed
138 (dotted line denoting) tilting package scale
140 shipping and mail manifest printer
142 package label printer
144 package door
146 letter door

200 letter-handling system assembly disposed in area denoted by dotted line 132 in Figure 1
202 PC board assembly for left-justification and width measurement of letters
203 electro-optical sensors for left-justification and width measurement
204 stepping motor, model Superior MH112 by Superior Electric Company, Bristol CT
206 gate mechanism letter stops
208 base plate
210 linear motion guide rail (THK SR301)
212 letter clamp/Ledex solenoid
214 guide rail support blocks
216 idler assembly
218 Hewlett-Packard ink-jet printer
220 ink-jet printer pivot plate
221 ink-jet printer pivot plate hinge

222 micro-switch for detecting when ink-jet printer 218 has rotated into fully upright position

223 scanner (e.g., DEST Personal Scan B5N-21SCA scanning unit scanner with B5N-21FED page feeder)

224 Ledex solenoid for retracting gate mechanism letter stops 206

226 PC board assembly for letter justification and length measurement

227 electro-optical sensors for letter justification and length measurement

228 letter scale

230 load cell for letter weighing, e.g., Transducers Incorporated, Cerritos CA, model no. 662A-D3-10-10P1

400 load cell for package weighing

402 trap door

404 linkage for simultaneous opening of trap door 402 and tilting of package scale 138

406 tilting hinge

408 linear actuator for providing mechanical force to tilt scale 138 and trap door 402, model 4Z846A by Dayton Corporation of Chicago

410 package storage compartment

600 package being tilted off of scale 138

602 packages stored in storage compartment after being tilted off of scale 138

700 linear actuator for providing mechanical force to rotate ink-jet printer 218, model 4Z846A by Dayton Corporation of Chicago

702 linkage

704 linkage

706 pivot point between linear actuator 700 and linkage 702

708 pivot point between linkage 702 and linkage 704

710 pivot point between linkage 702 and housing 102

900 dotted line indicating portion of Figure 9 which is shown in greater detail in Figure 10

1100 metal guides to prevent inward movement of door 108

1102 stepper motor

1104 Kevlar timing belt

1106 THK linear rail

1108 Honeywell opto-electronic limit switch

1110 THK bearing for movement along guide rail 1106

1112 idler for engaging other end of timing belt 1104

1200 PC bus

1201 main 80386-based computer

1202 voltage-to-frequency weigh card

1204 scanner interface card (e.g., DEST Corp.)

1206 Hitachi interface card

1208 Hitachi CDR-3500 CD ROM drive

1210 IDE hard disk/floppy disk

1212 IDE 40-mByte hard disk drive

1214 Scientific Solutions stepper motor card (Cybernetic Microsystems Inc., San Gregorio CA model no. CY-525A)

1216 Superior Motor Block 6180 -- PT Translator

1218 Superior Motor Block 6180 -- PT Translator

1220 input port

1222 input port

1224 input port

1226 safety micro-switch

1228 output port
1230 buzzer
1232 input port
1234 printer tilt relay
1236 output port
1238 paper ready indicator
1240 input port
1242 optical homing signals
1244 input port
1246 help switch
1248 input port
1250 package dump relay
1252 output port
1254 solenoids and clamps
1256 facsimile interface card (e.g., Intel SatisFAXtion) f
1258 multiple printer card
1260 voice digitizer (e.g., Covox Inc., Eugene Oregon - Voicemaster Digitizer System 2; software version 2.04/2.04x)
1262 modem (e.g., Hayes compatible)
1264 telephone line
1266 floppy disk controller

1300 main electronics board which is disposed in the area denoted by dotted line 130 in Figure 1
1302 printed circuit board
1304 computer power supply
1306 terminal strip
1308 3-inch wireway
1310 12-V, 15-V power supply
1312 30-V, 60-V power supply

ZP1000 signal distribution board - Easthem Associates, Houston

Some features of the machine 100 are particularly noteworthy. As shown in Figure 2, the ink jet printer is tilted downward when at rest (the normal position of the HP printer), and rotated up as needed to print upward. This is done by using an electrical linear actuator 700 and rotation linkages as shown in the Figure.

Packages are weighed by using a 100 lb load cell (strain gauge bridge). When a package is accepted, the package platform 138 is tilted by an electrical linear actuator 408 to tip the package into the storage compartment area ___.

The package window mechanism is secured in the up position by a Ledex size 6ep solenoid. Once the solenoid is activated, the lock is released and the Superior stepping motor MH-LLR-PF-8020 begins to rotate. The motion is transferred into linear motion up and down by using a Kevlar timing belt. The THK bearing and the idler pulley to home the window into its position. We are using optical sensor limit switches by Honeywell. The package window mechanism is mounted on the inner side of the package door.

The machine 100 of the illustrative embodiment is operated by computer software shown in detail in the Appendix, which comprises 265 pages each numbered in the lower right corner with serial numbers PI00001 through P100265. As shown in the Appendix, a series of screen displays is presented to a user/customer on the touch screen 110; the customer's responses on the touch screen 110 or other input device (e.g., a conventional computer keyboard) are used in controlling the machine's operations.

The software controlling the machine also includes a ZIP+4 database and lookup software. In the illustrative embodiment, the ZIP+4 database and control software distributed by the First Data Resource Company of Memphis, Tennessee is used.

The interrelationship of the various parts of the machine 100 may be conveniently described through a discussion of the operation of the machine.

A user/customer starts the machine by inserting a prepaid charge card into the receiving slot of a magnetic card reader 122, which activates the apparatus. The charge card may be a conventional stiff-paper card with a magnetic stripe on one side, similar to those used by the Bay Area Rapid Transit system (BART) in the San Francisco area.

The customer then touches the touch screen 110, which may be a conventional touch screen activated by an infrared array or sonic waves or resistance screen. Touching the screen activates a voice system which instructs the operator through a loudspeaker 112 what the next step will be. By following the voice instruction and the printed instructions on the screen 110, the customer is led step by step through the processing of a package or a letter.

As shown by the illustrative screen displays in the Appendix and by the flow diagrams in Figures _, once the customer has selected a First Class letter he follows the instructions. The customer then puts the letter into the letter acceptance slot 104. The letter handling system 200 moves the letter automatically through weighing, measuring, scanning and printing and finally depositing

the letter into the removable letter tray where all processed letters are collected.

Once a letter is processed, a receipt is printed for any letter that is certified, registered and insured. The cost of mailing is deducted from the prepaid magnetic card and the card is returned to the customer.

The customer is able to request an electronic mail operation (e.g., using a conventional electronic mail service such as MCI Mail) using one of the two types of floppy-disk drives 124, 126 by inserting a floppy disk into the drive and following the voice/touch screen 110 instruction. The customer is thereby able to transmit his files to another computer. The cost of the electronic mailing is deducted from the prepaid magnetic card and the card is returned to the customer.

The customer is able to request to use the built-in FAX scanner 120 in order to transmit documents across telephone lines to another location. The customer follows the voice and screen instruction and then inserts his documents one by one into the FAX scanner 120. The machine 100 automatically transmits the documents to the other location. The cost of mailing is deducted from the prepaid magnetic card and the card is returned to the customer.

The customer may select after inserting his prepaid magnetic card to process packages by touching the screen 110 and following the voice instructions. The package window door 106 opens, the customer puts the package inside the window on the package/scale/tilt assembly 400. The scale weighs the package; this weight is transmitted to the computer which calculates the charges according to the destination zipcode. Once all the information that

relates to the shipper and destination is entered by the customer using the touch screen 110, a shipping label is printed using a package label printer 142. The customer pastes the label to the package and touches the screen on the appropriate box as shown by the illustrative screen displays in the Appendix. Once the customer has finished the processing, the package window door 108 is automatically closed. A receipt is produced by the receipt printer 128. The cost of shipping the package is deducted from the prepaid magnetic card and the card is returned to the customer.

To detect customer attempts to cheat (e.g., by submitting a light package for weighing but actually depositing a heavier package for shipping), the package is reweighed just prior to acceptance. If more than a +1% variation is detected, an error message is generated and the package is not accepted.

To reduce the chance of a too-heavy weight measurement (e.g., because the customer inadvertently has his finger on the scale), the scale detects weight variations of 0.01 oz. The weight is not measured for shipping-charge computation purposes until the weight stabilizes.

The tare (zero weight) of the scale is monitored to verify that nothing is left on the scale and that the scale is not damaged.

It will be appreciated that the foregoing embodiment is described for purposes of illustration and not as a limitation on the exclusive rights of the inventors. Various changes may be made (e.g., through the substitution of components; implementation of software functions in hardware and vice versa; and the like)

without departing from the spirit of the invention. The embodiments which are claimed as the exclusive property of the inventors are as described in the claims below.

CLAIMS:

1. An automated self-service package shipping machine comprising:

(a) means for receiving a package;

(b) screen-display means for displaying user instructions;

(c) user input means for transmitting user preferences;

(d) means for printing a destination label;

(e) means for printing a customer receipt; and

(f) locking means for securing the package.

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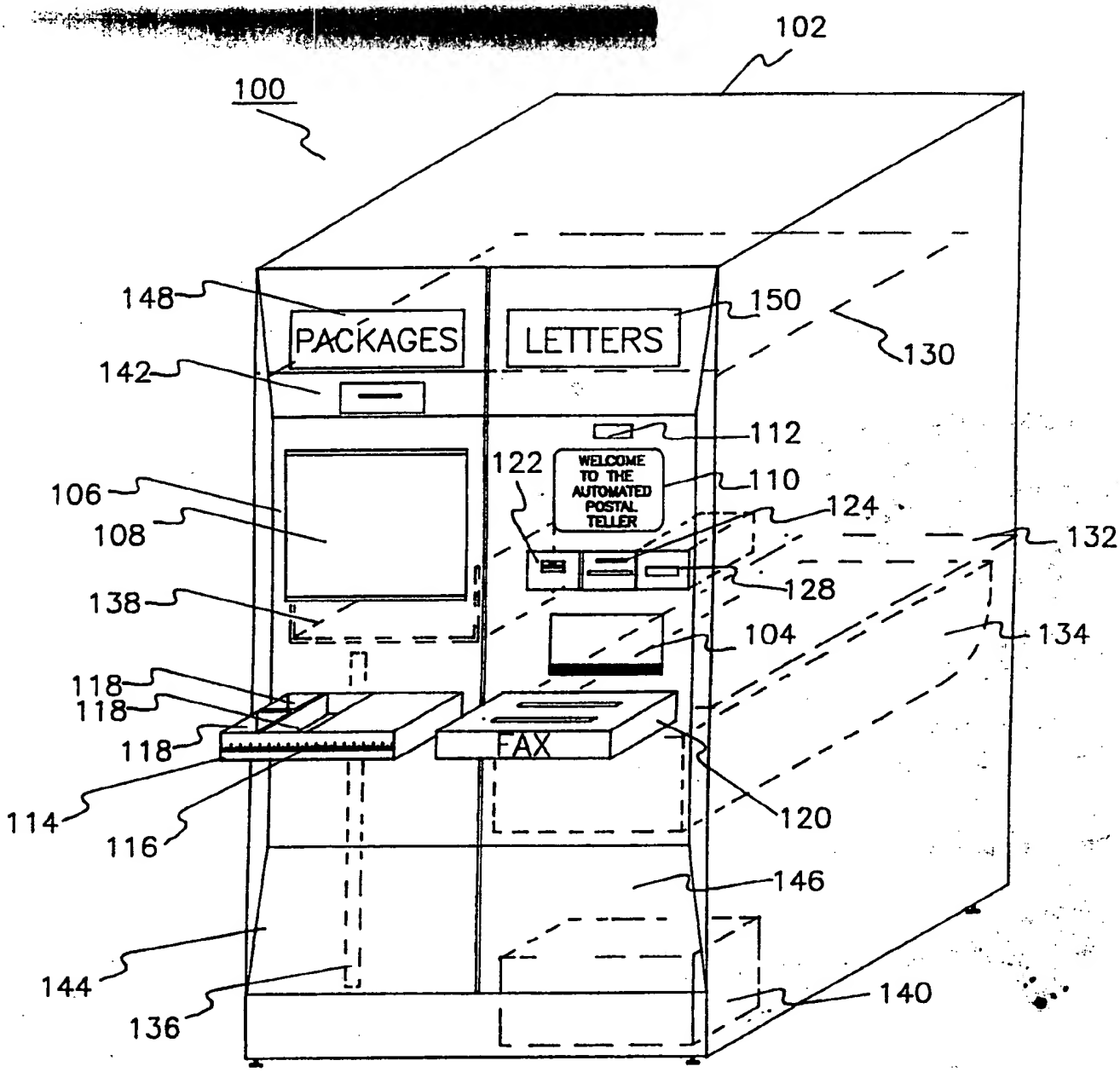
102
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WELCOME TO THE AUTOMATED POSTAL TELLER
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Figure 1

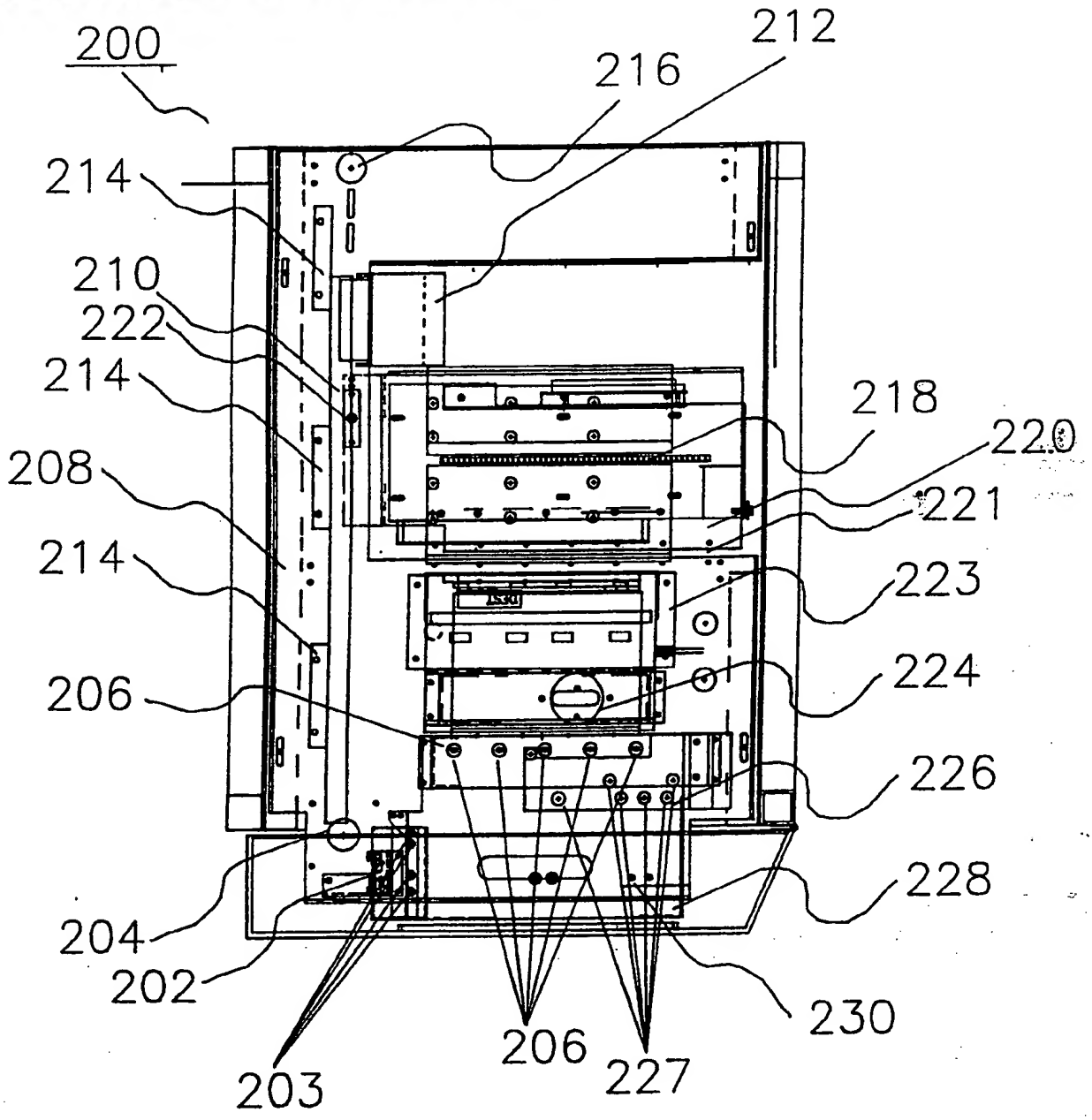
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Figure 2

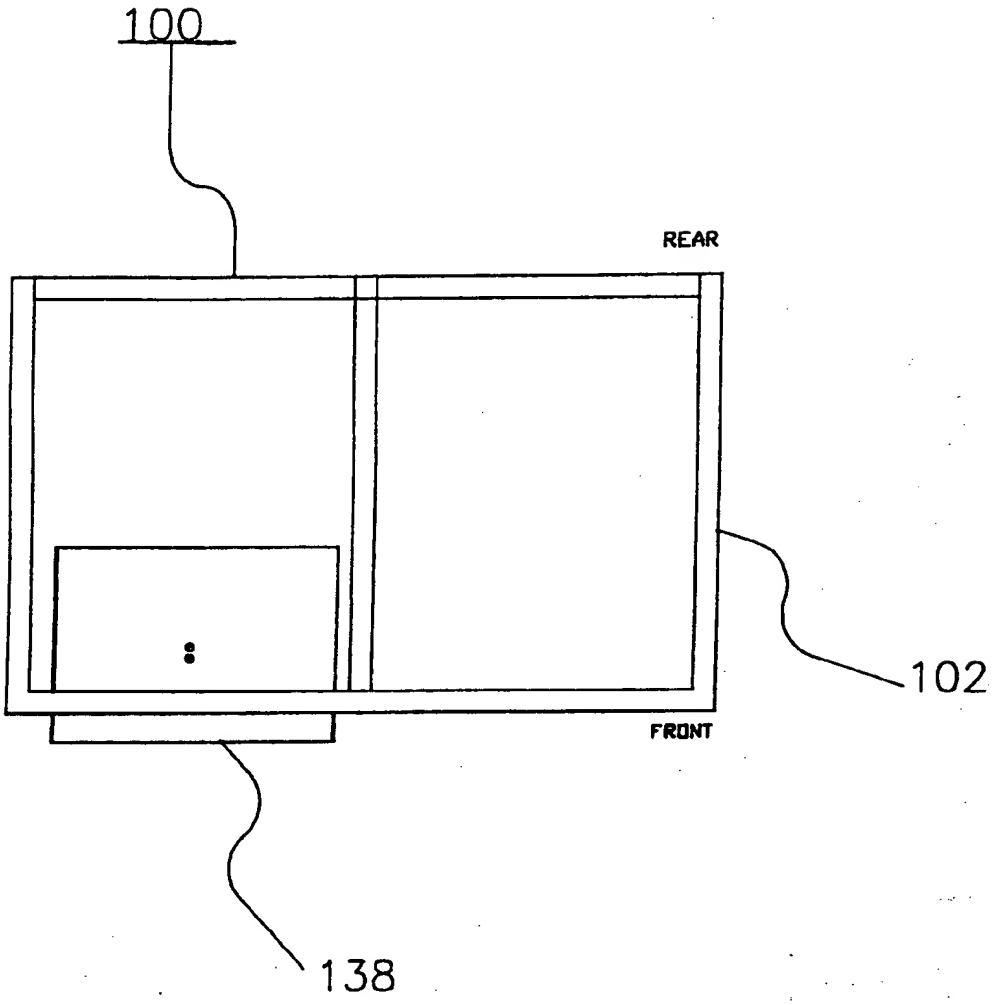

Figure 3

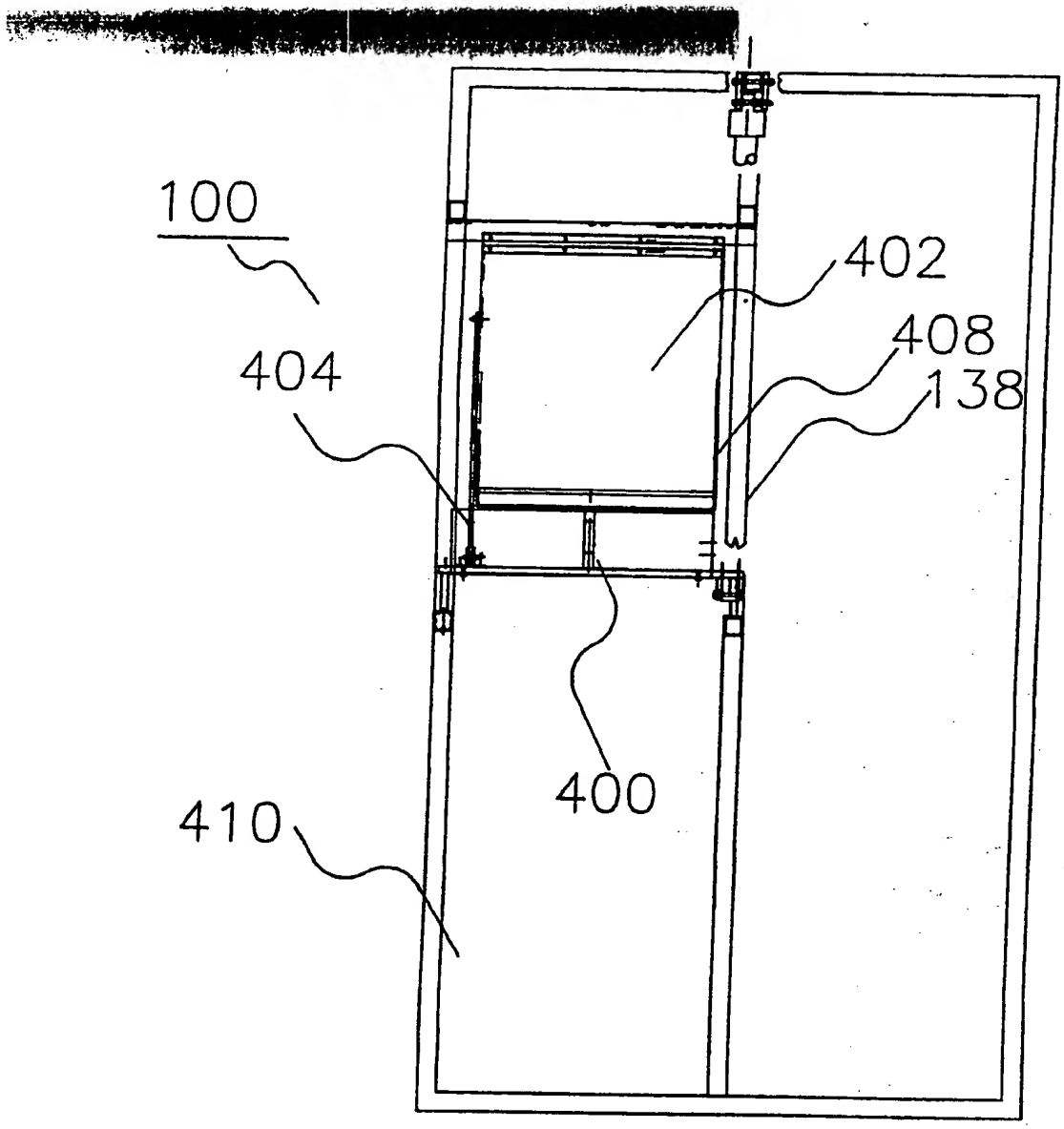

Figure 4

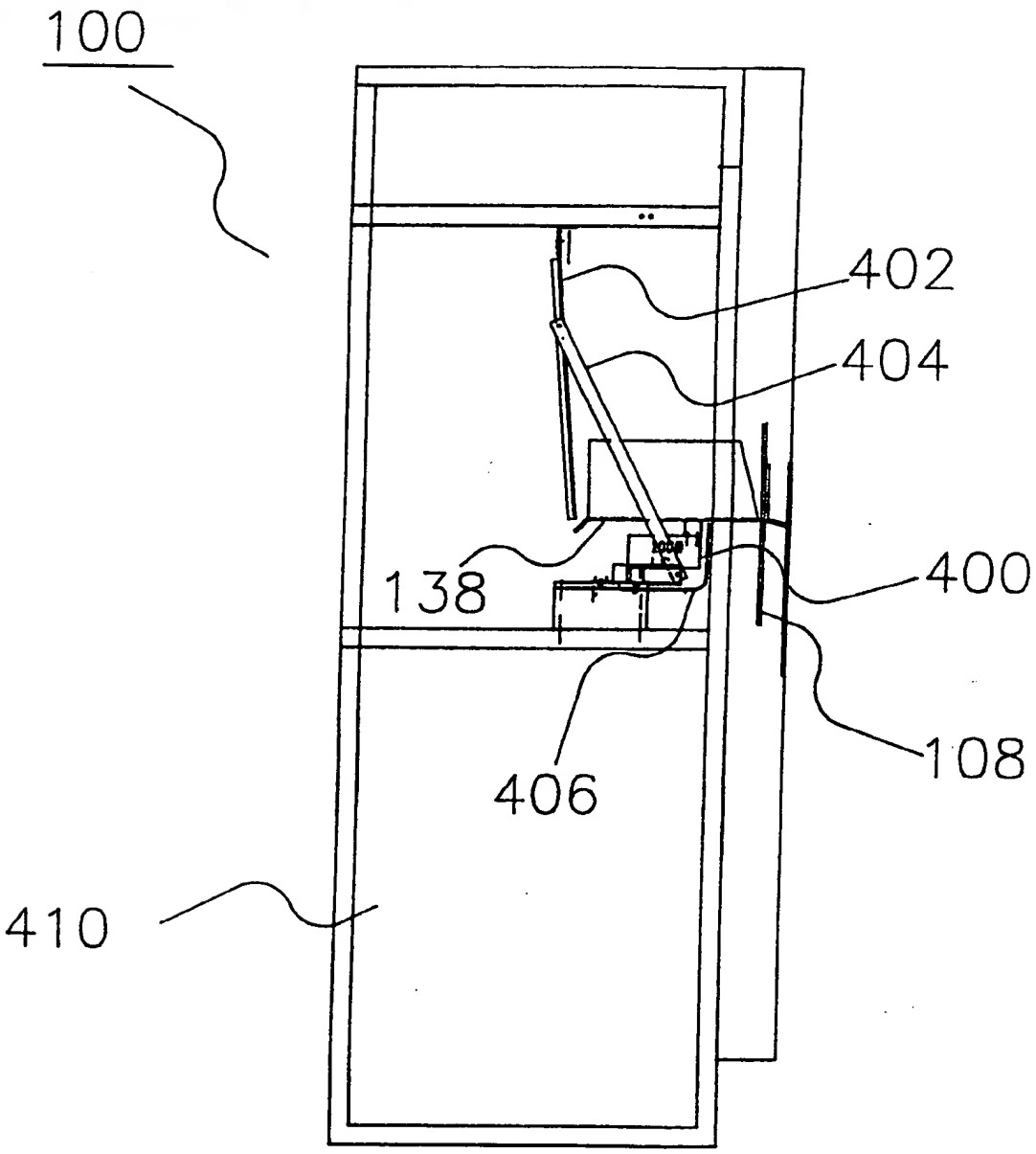

Figure 5

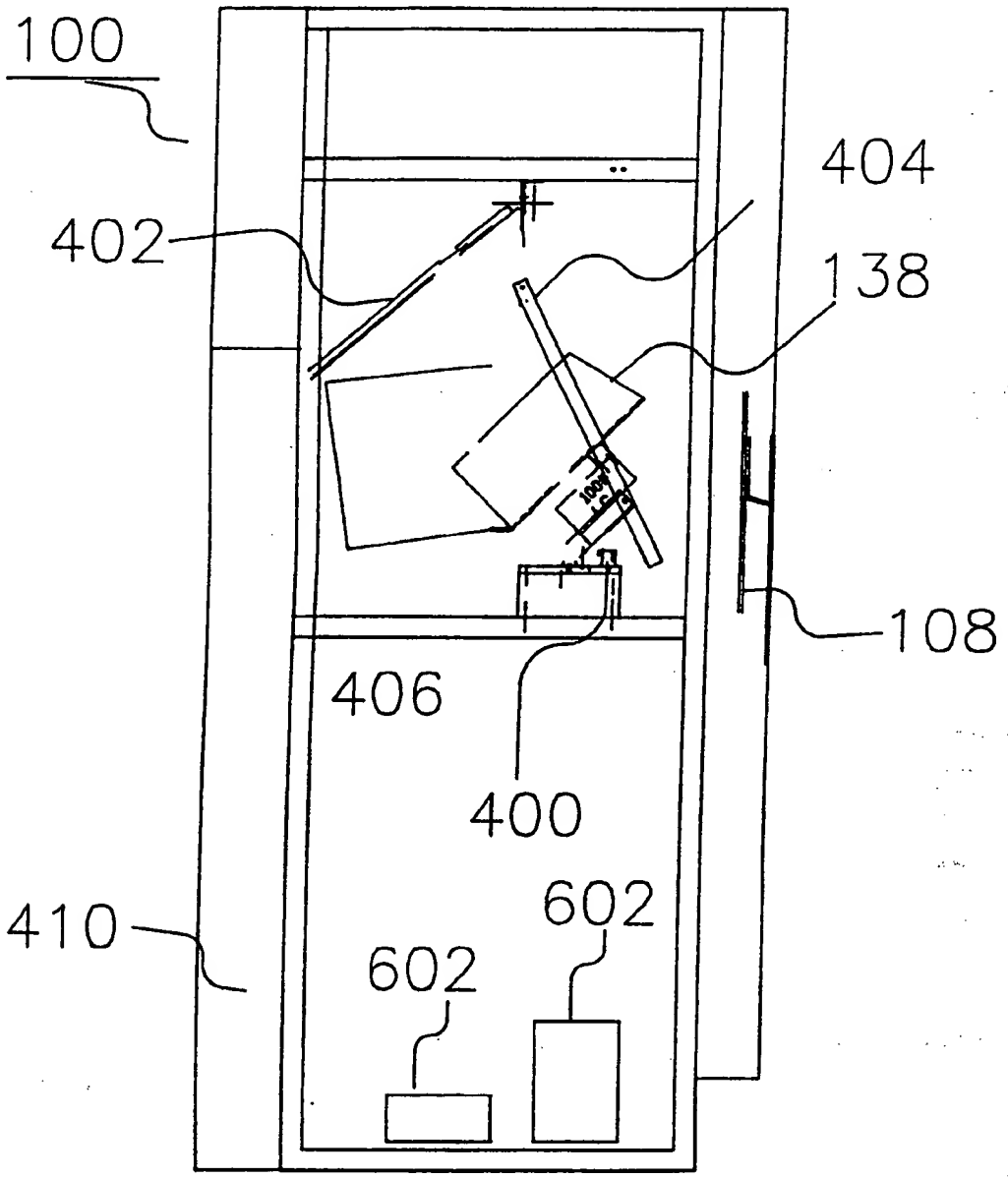

Figure 6

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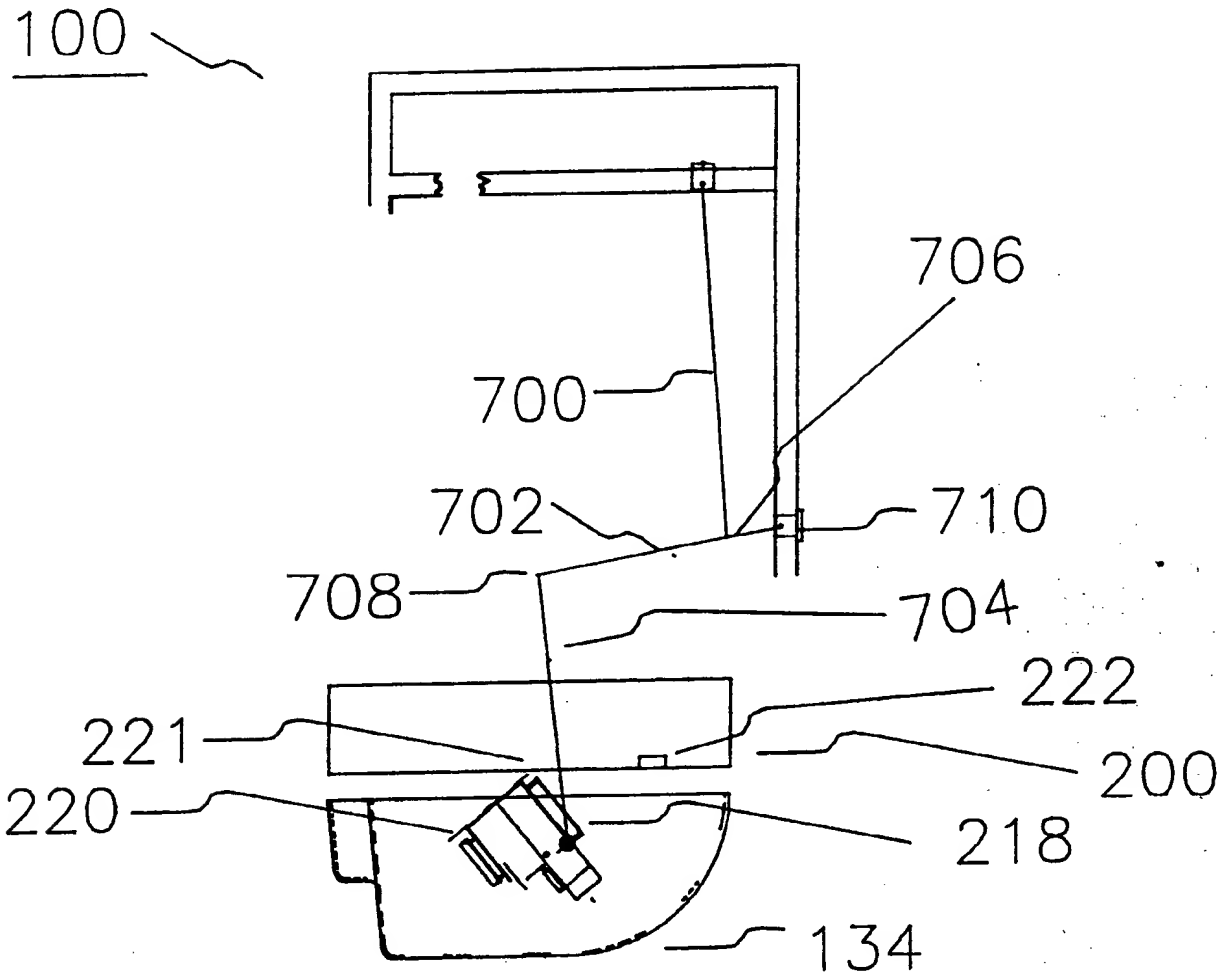

Figure 7

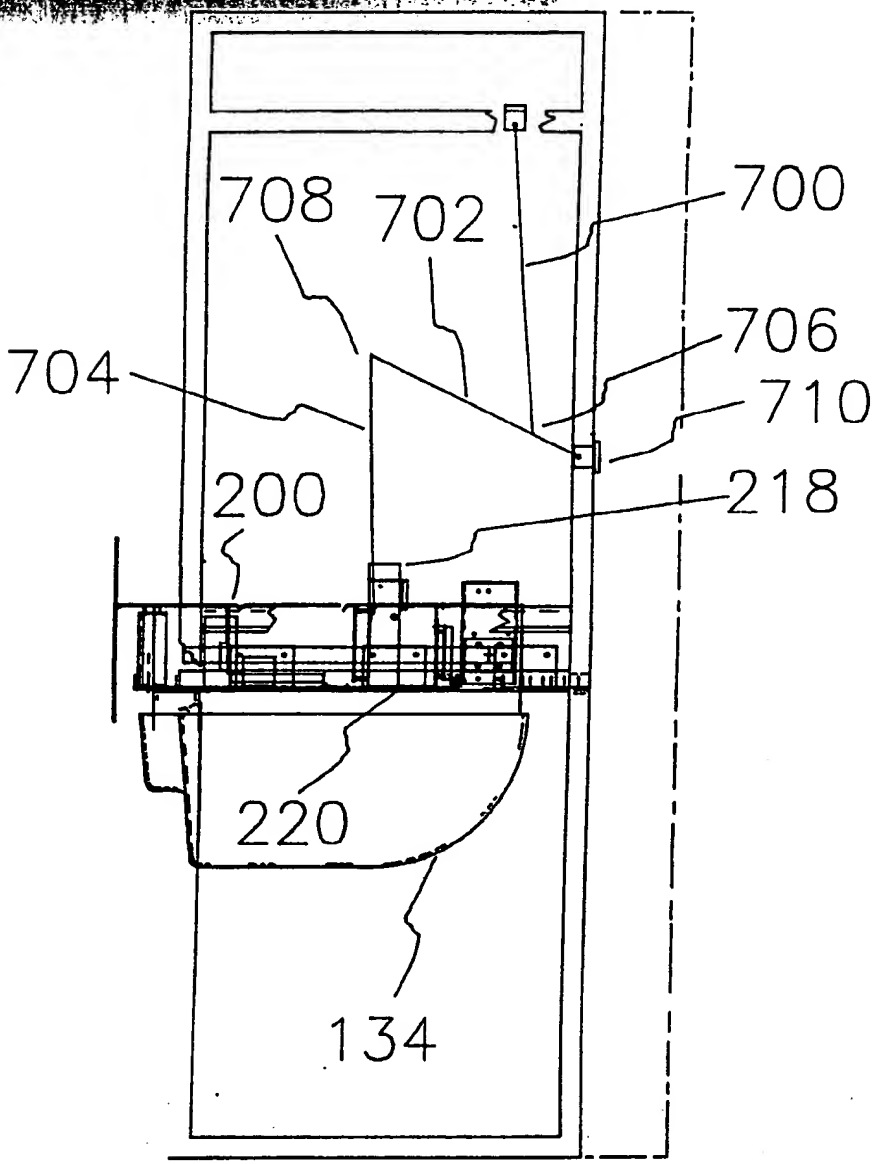

Figure 8

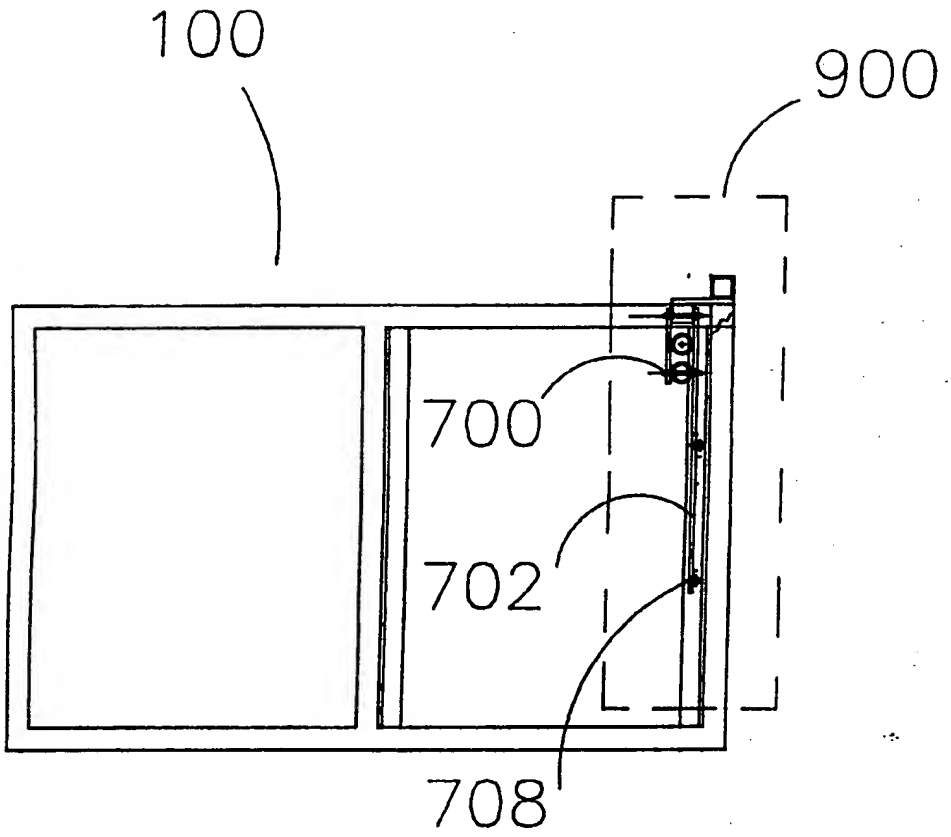

Figure 9

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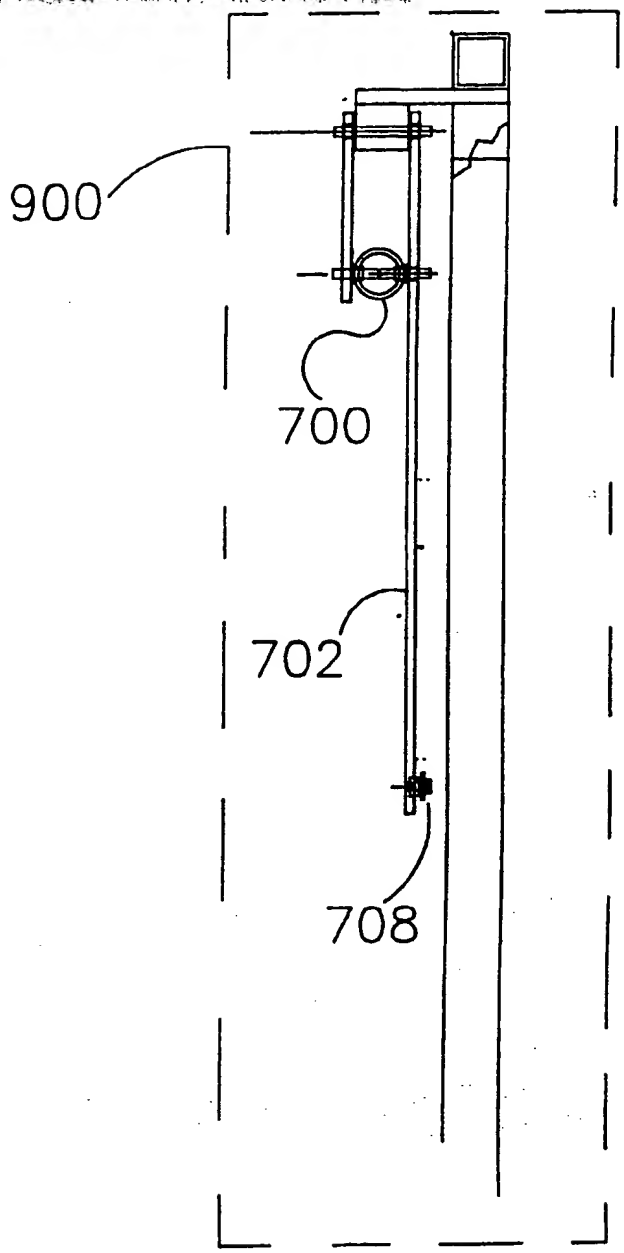


Figure 10

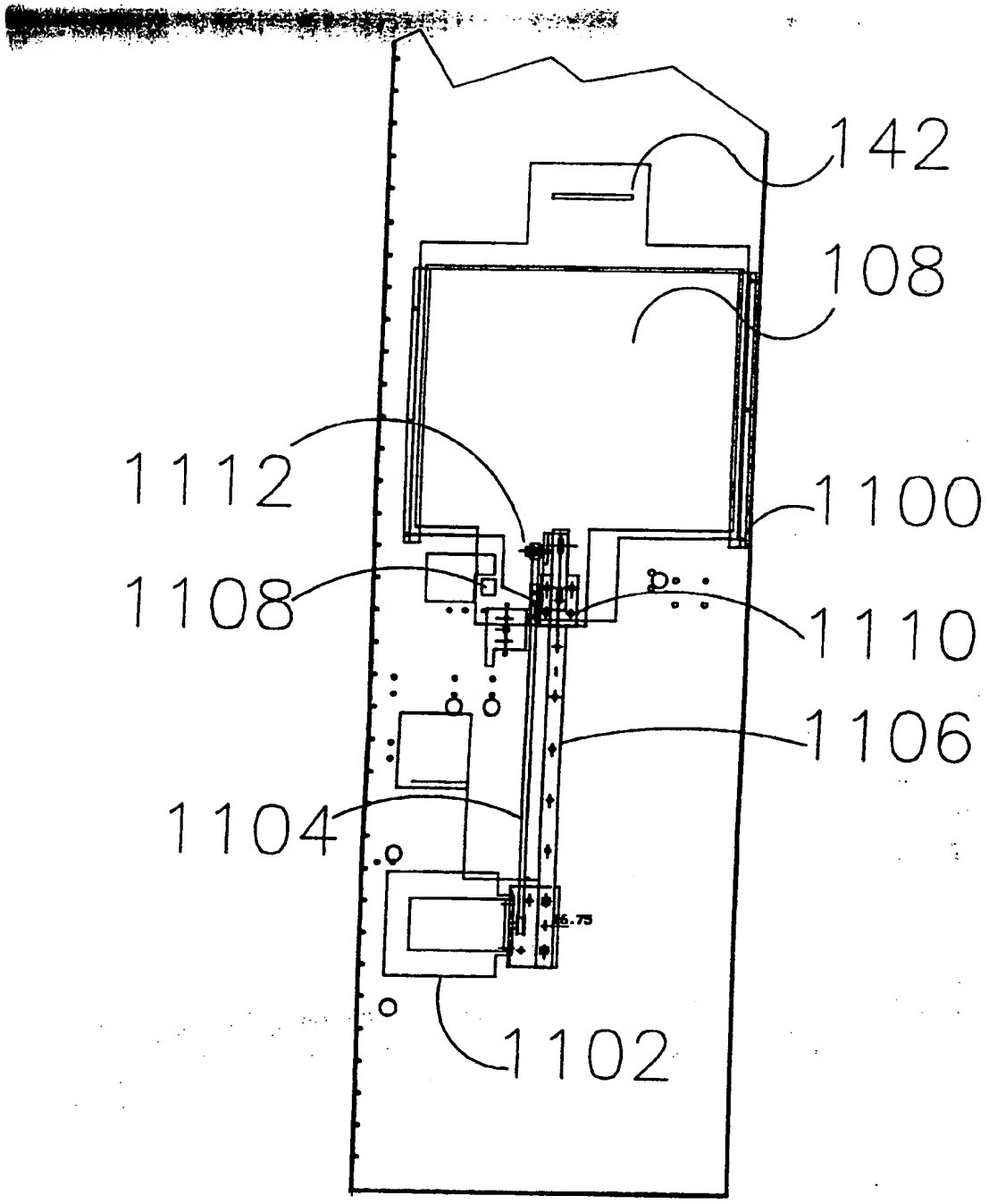
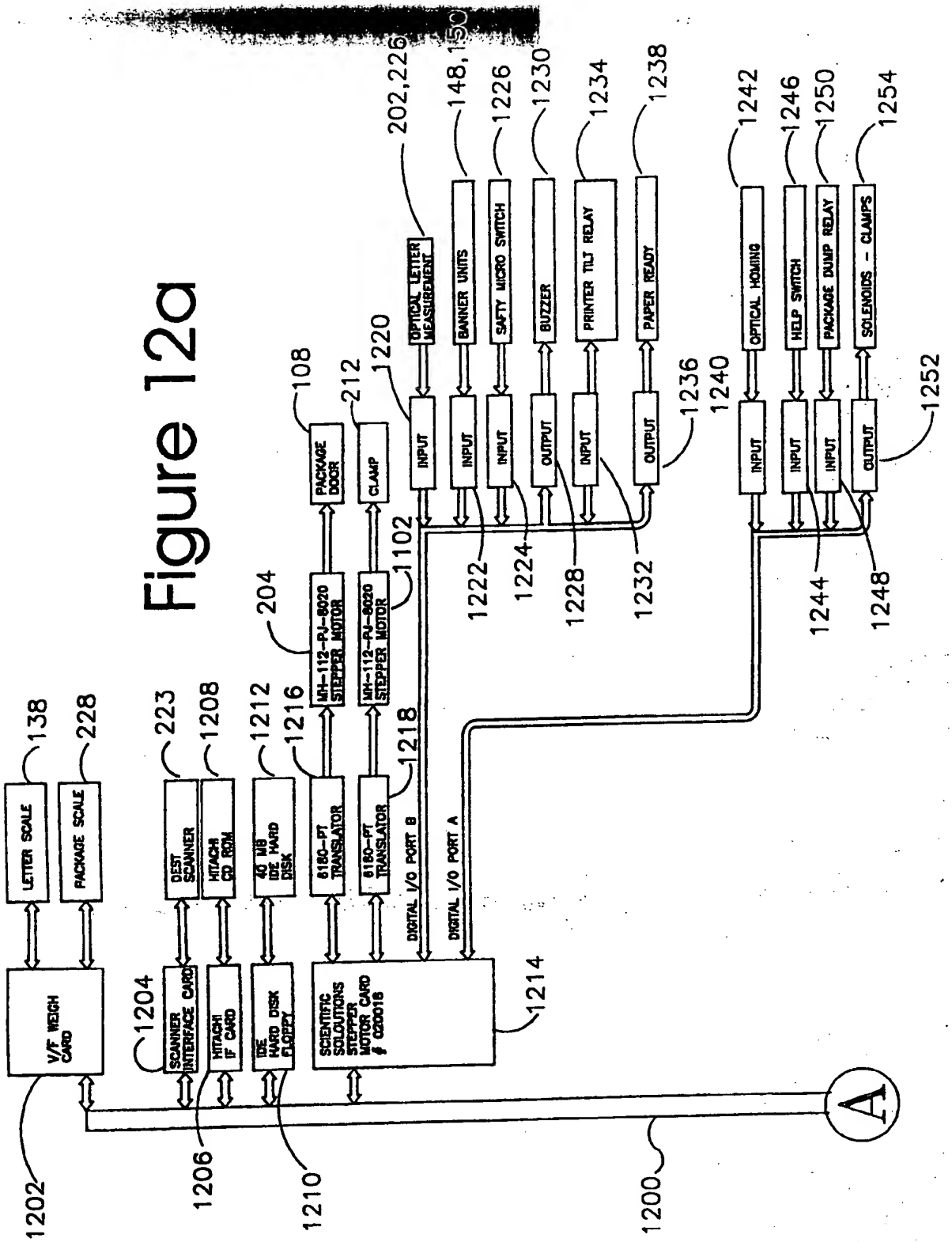


Figure 11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PACKAGE SCALE
DEST SCANNER
HITACHI CD ROM
40 MB IDE HARD DISK
6180-PT TRANSLATOR
6180-PT TRANSLATOR
VH-112-RJ-8020 STEPPER MOTOR
VH-112-RJ-8020 STEPPER MOTOR
PACKAGE DOOR
CLAMP
OPTICAL LETTER MEASUREMENT
BANNER UNITS
SAFTY MICRO SWITCH
BUZZER
PRINTER TILT RELAY
PAPER READY
OPTICAL HOMING
HELP SWITCH
PACKAGE DUMP RELAY
SOLENOIDS - CLAMPS
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DIGITAL I/O PORT A
V/F WEIGH CARD
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HITACHI I/F CARD
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SCIENTIFIC SOLUTIONS STEPPER MOTOR CARD # 020018
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1244
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1248
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138
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202,226
148,150
1102
1200

Figure 12a

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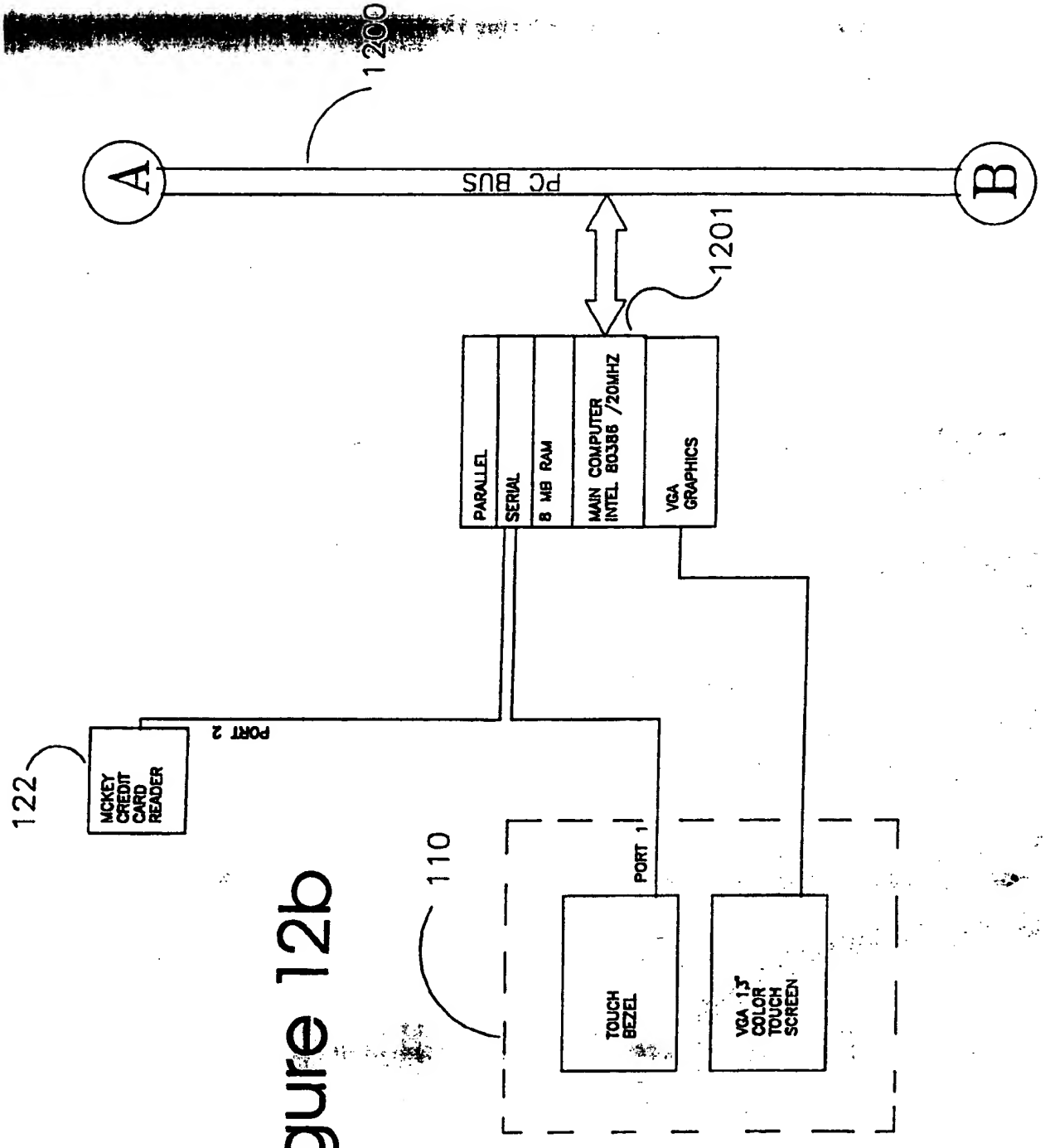
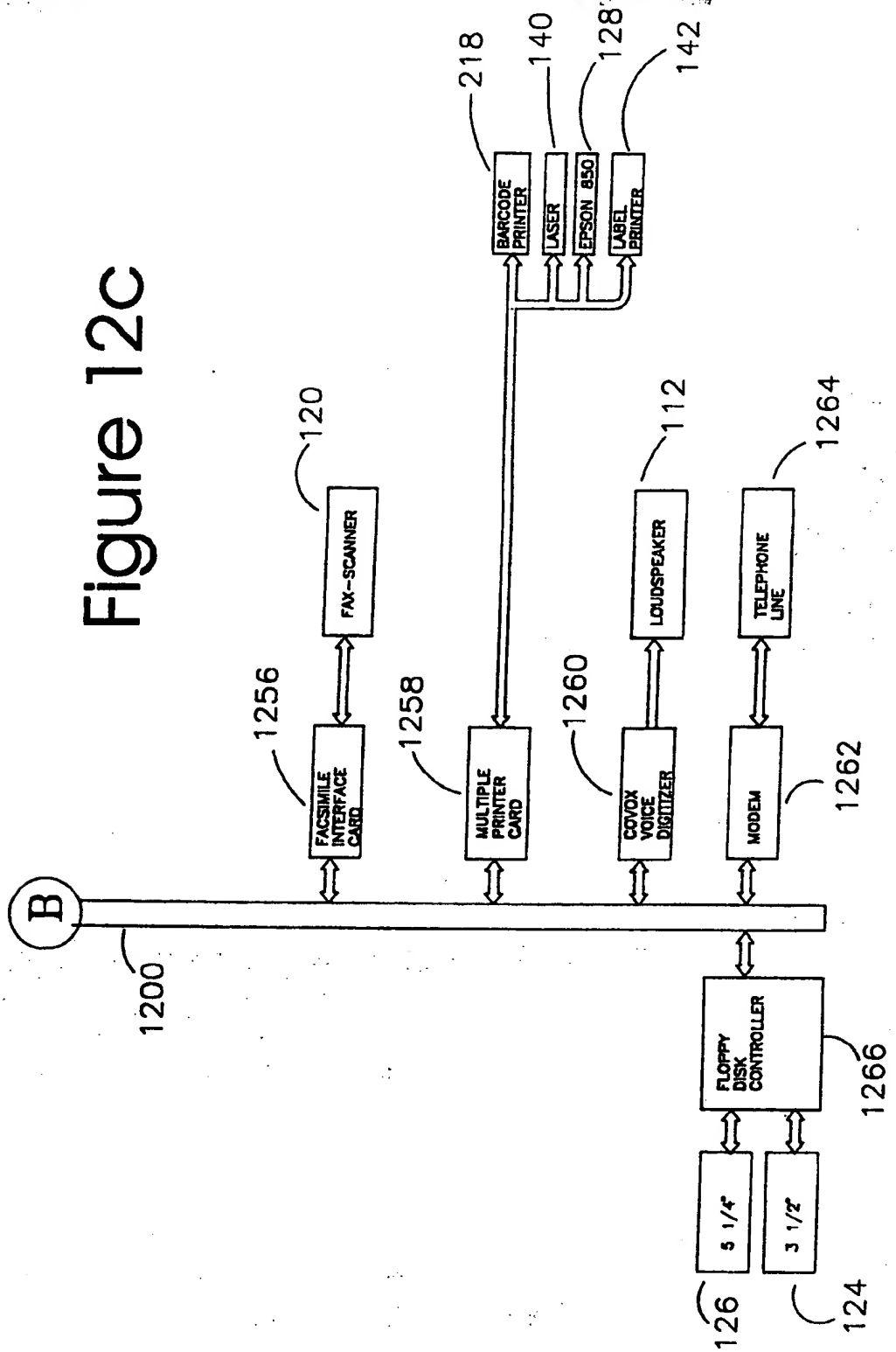


Figure 12b

Figure 12c


218
140
128
142
BARCODE PRINTER
LASER
EPSON 850
LABEL PRINTER
120
112
1264
FAX-SCANNER
LOUDSPEAKER
TELEPHONE LINE
1256
1258
1260
1262
FACSIMILE INTERFACE CARD
MULTIPLE PRINTER CARD
COVOX VOICE DIGITIZER
MODEM
B
1200
FLOPPY DISK CONTROLLER
1266
5 1/4"
3 1/2"
126
124

15/45

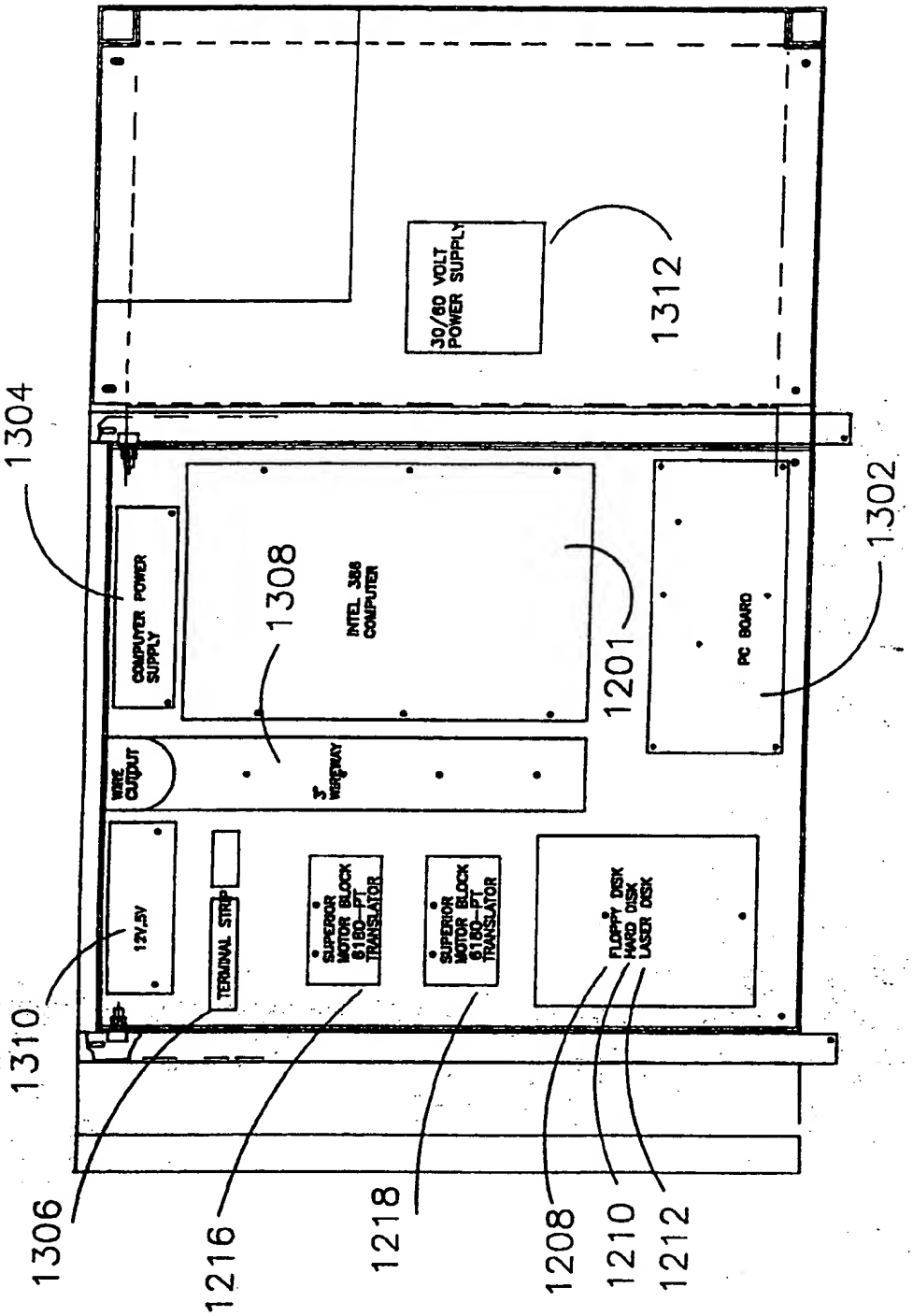


Figure 13

16/45

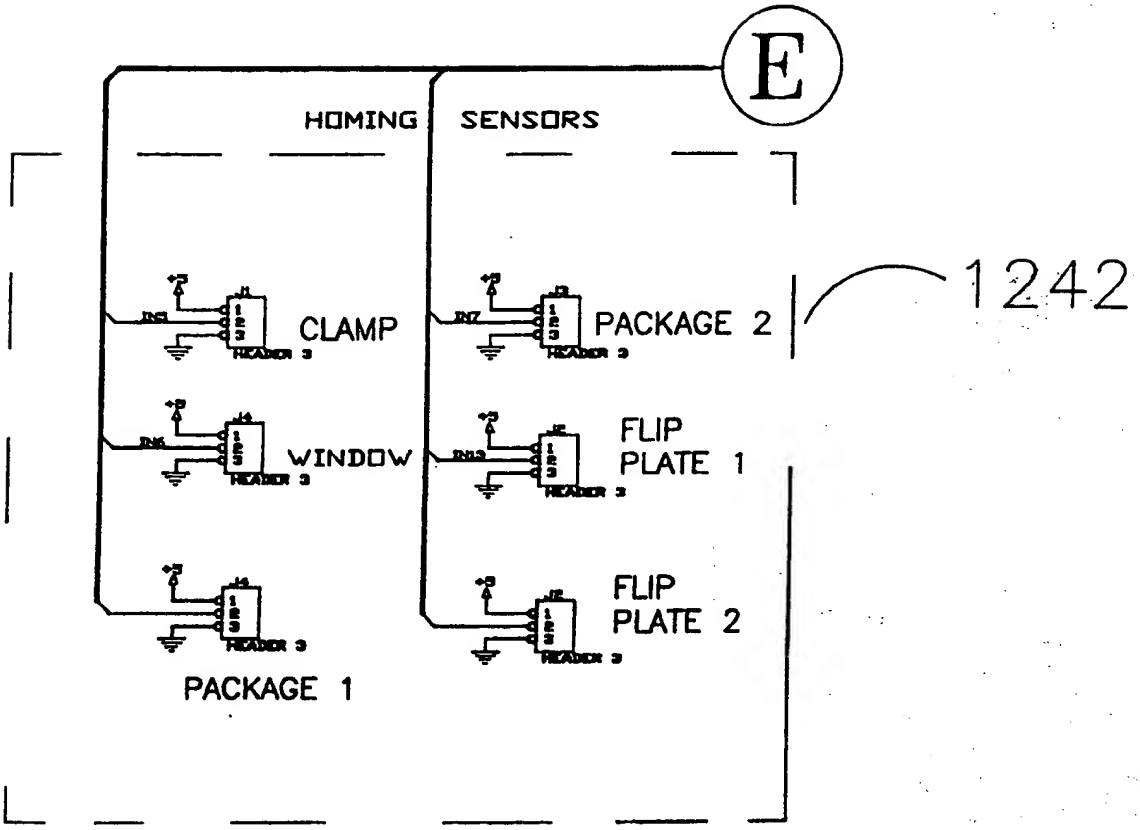


Figure 14a

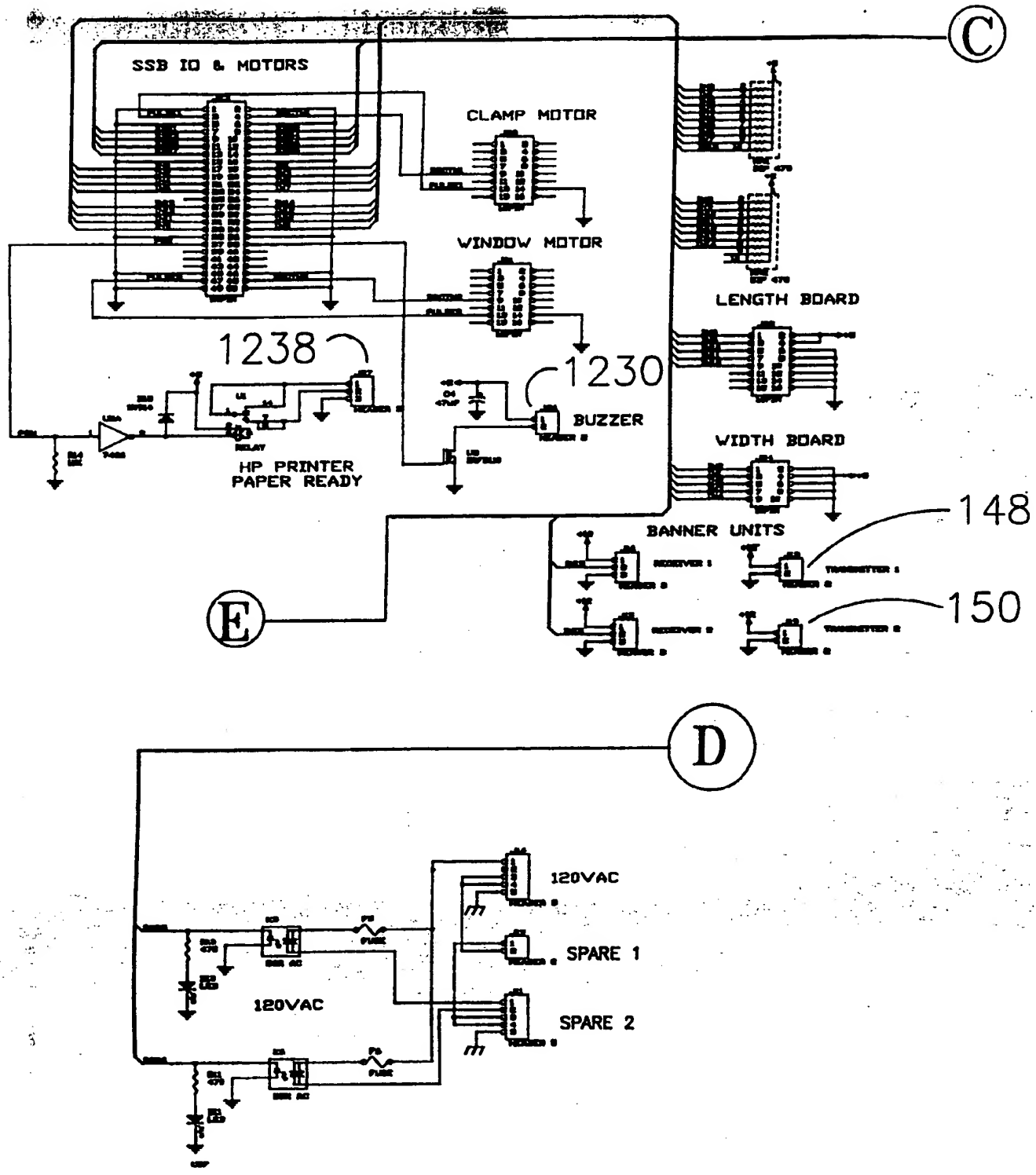

C
SSB IO & MOTORS
CLAMP MOTOR
WINDOW MOTOR
LENGTH BOARD
1238
1230
BUZZER
WIDTH BOARD
HP PRINTER
PAPER READY
148
BANNER UNITS
E
150
D
120VAC
SPARE 1
120VAC
SPARE 2

Figure 14b

18/45

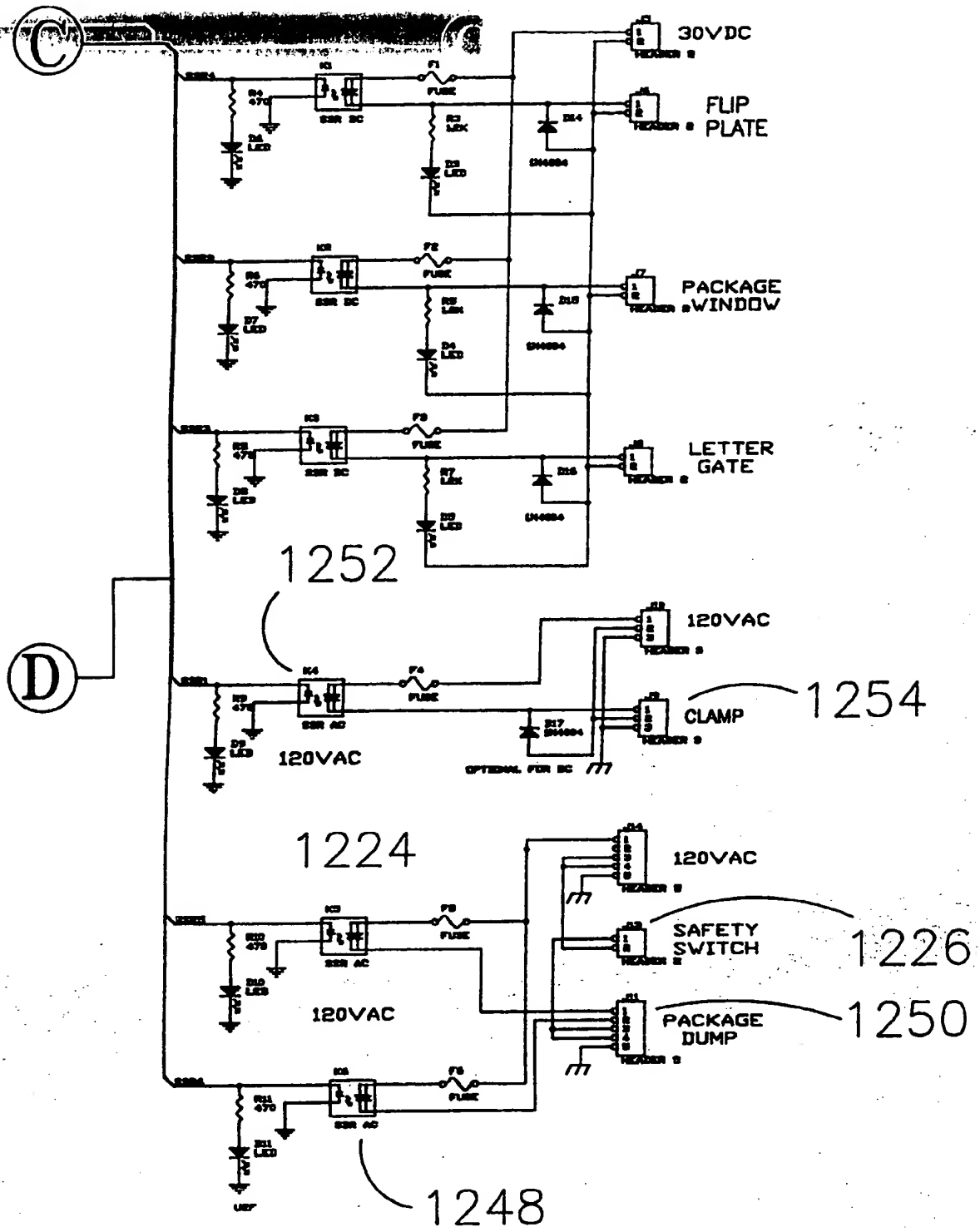


Figure 14c

19/45

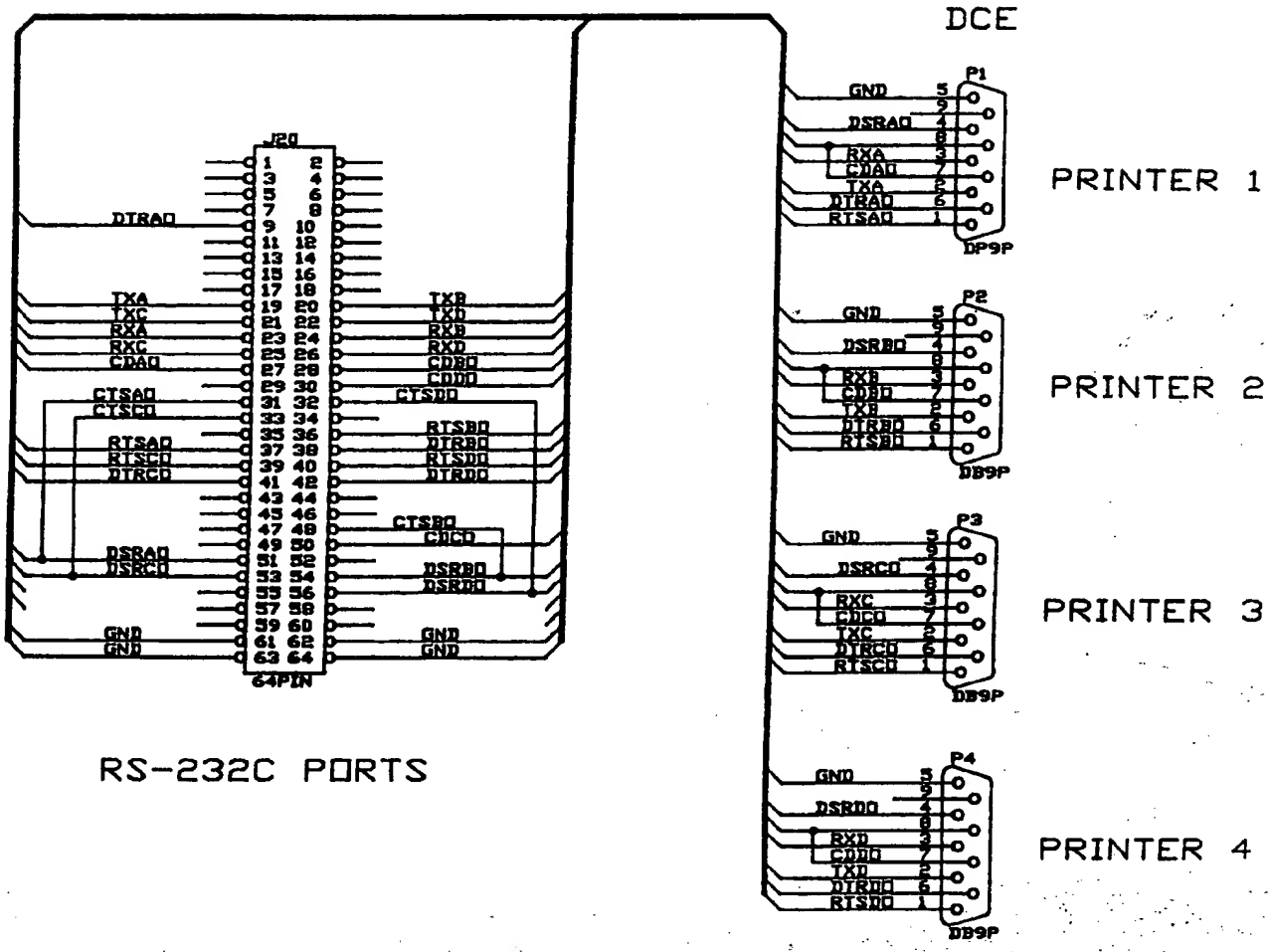


Figure 15

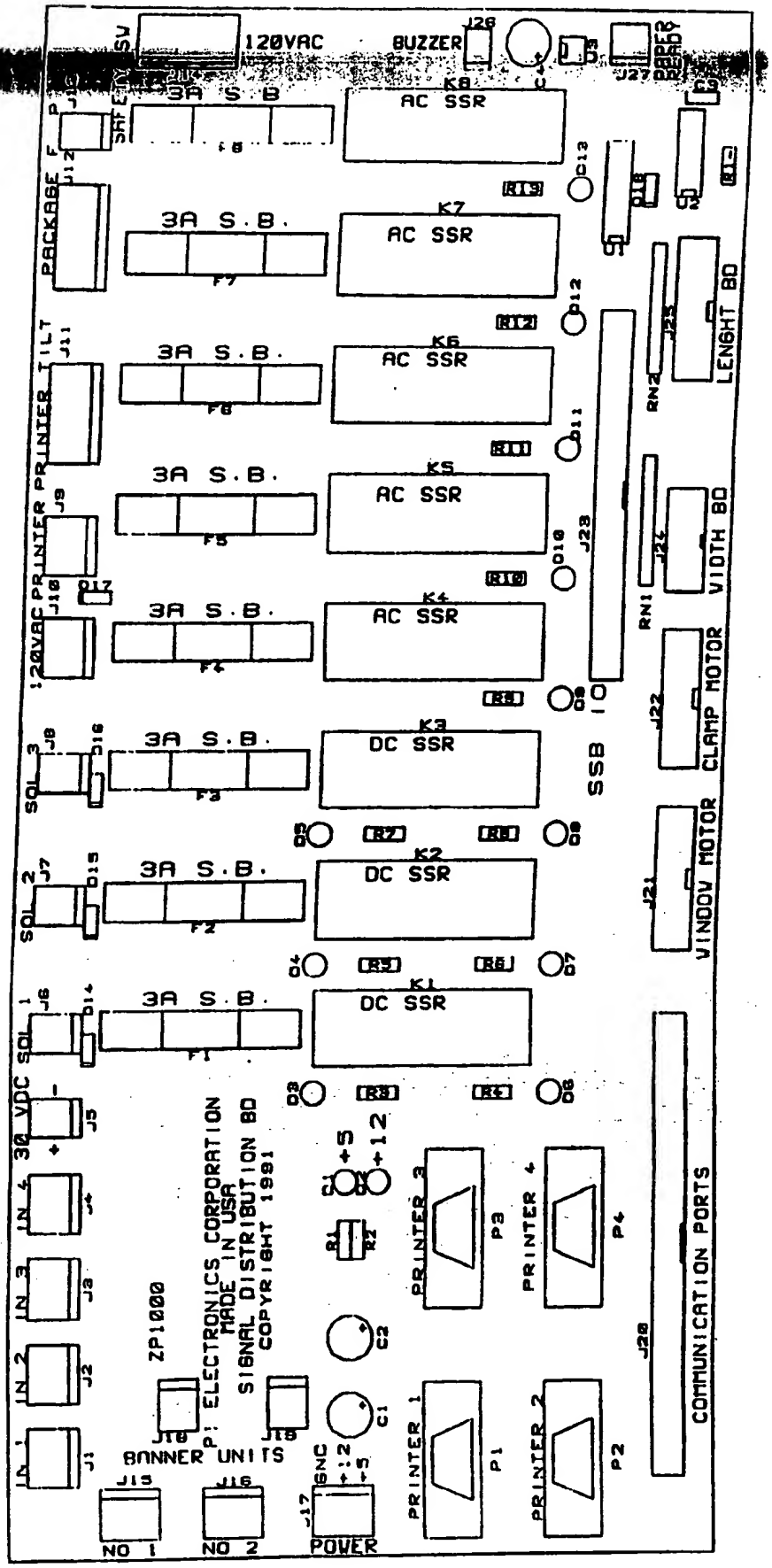

120VAC
BUZZER
3A S.B.
AC SSR
K8
K7
K6
K5
K4
DC SSR
K3
K2
K1
PACKAGE
TILT
PRINTER
120VAC PRINTER
SOL 3
SOL 2
SOL 1
30 VDC
IN 4
IN 3
IN 2
IN 1
LENGHT BD
VIDTH BD
CLAMP MOTOR
VINDOV MOTOR
SSB
COMMUNICATION PORTS
PRINTER 1
PRINTER 2
PRINTER 3
PRINTER 4
BANNER UNITS
NO 1
NO 2
POWER
ZP1000
ELECTRONICS CORPORATION
MADE IN USA
SIGNAL DISTRIBUTION BD
COPYRIGHT 1991

Figure 16

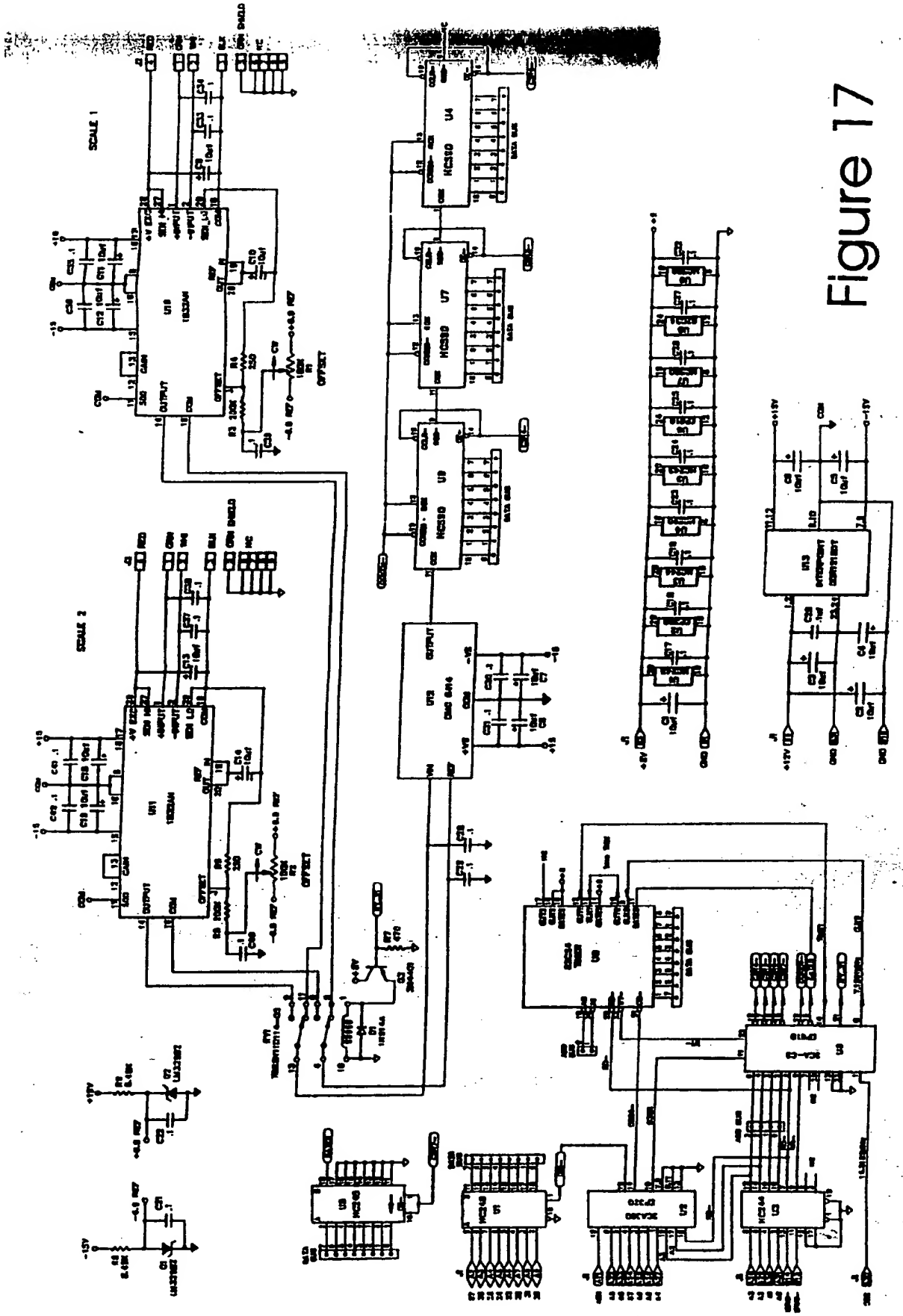


Figure 17

[redacted] ELECTRONICS CORP

17-Nov-89 BOARD SCALE DB FILE SCALE.WK1

CKT REF	PART #	DESCRIPTION	MANUFACT	SUPPLIER	PER BD.
U01,5	MC74HC245N	OCTAL, TS, BUS, XCVR	MOTOROLA	HALL-MARK	2
U02	EP320DC-2	EPLD, 20-PIN	ALTERA, TI	MARSHALL	1
U03	MC74HC244N	OCTAL, TS, INV BUS DRV	MOTOROLA	HALL-MARK	1
U04,7,9	SN74HC590AN	8-BIT, CNTR, BUF T-S	TI	MARSHALL	3
U06	EP610DC-30	EPLD, 24-PIN	ALTERA, TI	MARSHALL	1
U08	CP82C54	TIMER, CMOS	HARRIS	SCHWEBER	1
U10,11	1B32AN	LOADCELL, AMP, EXCIT	ANALOG DEV	ANALOG DEV	2
U12	DMC8414	V/F, 1MHz	DYMEC	DYMEC	1
U13	DDR1215DT	DC-DC CONV, 12-15V	INTERPOINT	INTERPOINT	1
R01,2	3299X-1-104	POT, 100K	BOURNS	ANY	2
R03,5	200K	RES, CF, 1/4W, 5%	ANY	ANY	2
R04,6	250	RES, CF, 1/4W, 5%	ANY	ANY	2
R07	470	RES, CF, 1/4W, 5%	ANY	ANY	1
R08,9	6.49K	RES, MF, RN55D, 1%	ANY	ANY	2
C01-16	199D106X9025CA1	10UF, 25V, 20%, TANT	SPRAGUE	MARSHALL	16
C17-42	CW20C104K	.1UF, 50V, 10%	CENTRLAB	MARSHALL	26
Q03	2N4401	NPN, TRAN, SIG	MOTOROLA	SCHWEBER	1
Q01,2	LM329BZ	ZENER, REF, 6.9V	NATIONAL	SCHWEBER	2
D01	1N914A	DIODE, SIG	ANY	ANY	1
J02,3	747844-4	DB9, RT ANG, FEMALE	AMP	KENT	2
	205817-1	NUTS, 10-40, FOR ABOVE	AMP	KENT	2
RY01	TB85N11D114-05	RELAY, SPDT	P&B	HARRISON	1
BD	PCB 50011-01	BOARD,	Pi	Pi	1

Figure 17.1

23/40

[redacted]TRONICS CORP

Pi ELECTRONICS CORP

17-Nov-89 BOARD SCALE DB FILE SCALE.WK1

CKT REF	PART #	DESCRIPTION	MANUFACT	SUPPLIER	PER BD.
U10,11	1B32AN	LOADCELL, AMP, EXCIT	ANALOG DEV	ANALOG DEV	2
R03,5	200K	RES, CF, 1/4W, 5%	ANY	ANY	2
R04,6	250Λ	RES, CF, 1/4W, 5%	ANY	ANY	2
D01	1N914A	DIODE, SIG	ANY	ANY	1
R08,9	6.49K	RES, MF, RN55D, 1%	ANY	ANY	2
R01,2	3299X-1-104	POT, 100K	BOURNS	ANY	2
R07	470	RES, CF, 1/4W, 5%	ANY	ANY	1
U12	DMC8414	V/F, 1MHz	DYMEC	DYMEC	1
U01,5	MC74HC245N	OCTAL, TS, BUS, XCVR	MOTOROLA	HALL-MARK	2
U03	MC74HC244N	OCTAL, TS, INV BUS DRV	MOTOROLA	HALL-MARK	1
RY01	TB85N11D114-05	RELAY, SPDT	P&B	HARRISON	1
U13	DDR1215DT	DC-DC CONV, 12-15V	INTERPOINT	INTERPOINT	1
J02,3	747844-4	DB9, RT ANG, FEMALE	AMP	KENT	2
	205817-1	NUTS, 10-40, FOR ABOVE	AMP	KENT	2
U02	EP320DC-2	EPLD, 20-PIN	ALTERA, TI	MARSHALL	1
C01-16	199D106X9025CA1	10UF, 25V, 20%, TANT	SPRAGUE	MARSHALL	16
U06	EP610DC-30	EPLD, 24-PIN	ALTERA, TI	MARSHALL	1
C17-42	CW20C104K	.1UF, 50V, 10%	CENTRLAB	MARSHALL	26
U04,7,9	SN74HC590AN	8-BIT, CNTR, BUF T-S	TI	MARSHALL	3
BD	PCB 50011-01	BOARD,	Pi	Pi	1
Q03	2N4401	NPN, TRAN, SIG	MOTOROLA	SCHWEBER	1
Q01,2	LM329BZ	ZENER, REF, 6.9V	NATIONAL	SCHWEBER	2
U08	CP82C54	TIMER, CMOS	HARRIS	SCHWEBER	1

Figure 17.2

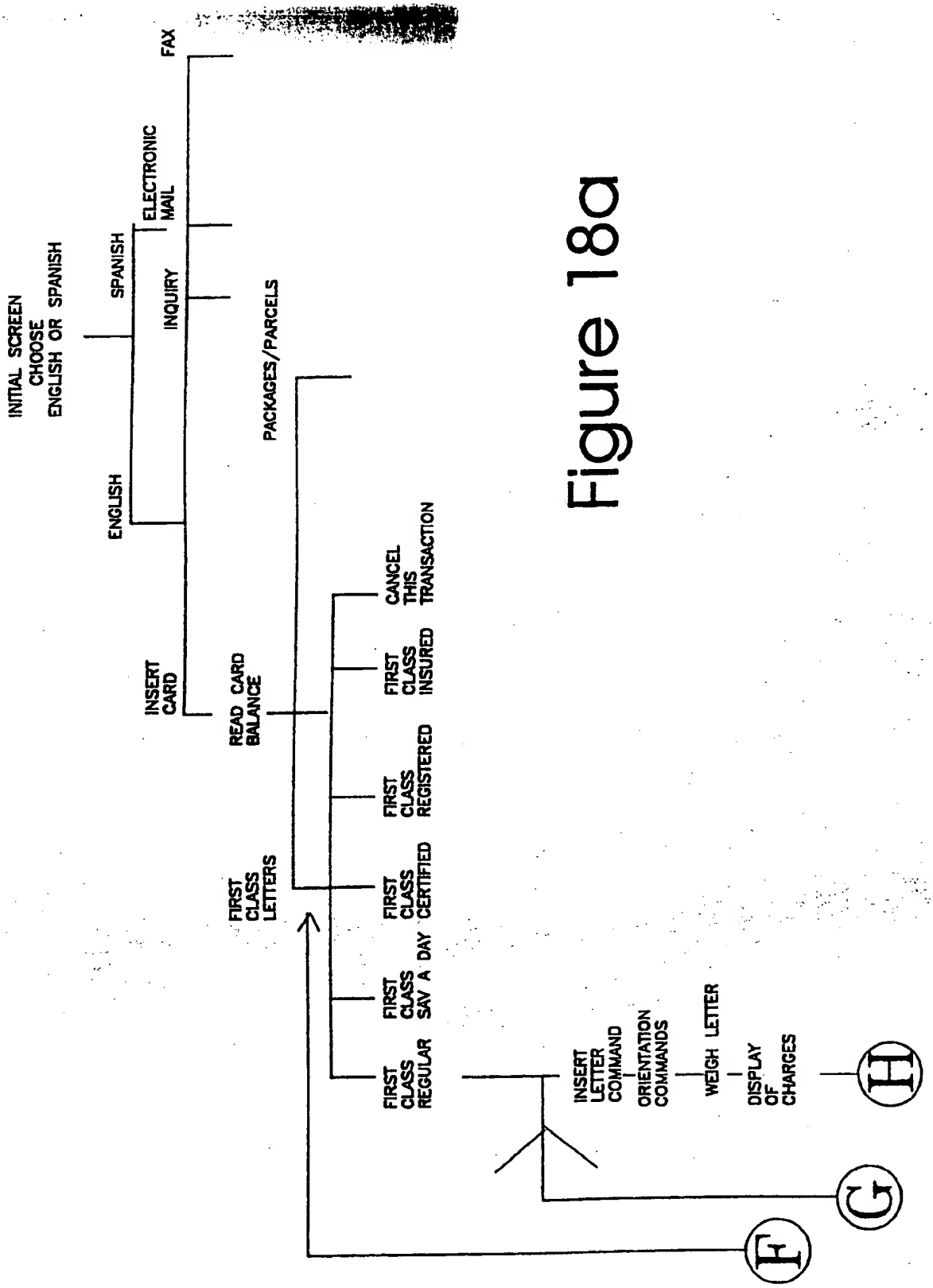

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INQUIRY
FAX
ELECTRONIC MAIL
INSERT CARD
READ CARD BALANCE
PACKAGES/PARCELS
FIRST CLASS LETTERS
FIRST CLASS REGULAR
FIRST CLASS SAV A DAY
FIRST CLASS CERTIFIED
FIRST CLASS REGISTERED
FIRST CLASS INSURED
CANCEL THIS TRANSACTION
INSERT LETTER COMMAND
ORIENTATION COMMANDS
WEIGH LETTER
DISPLAY OF CHARGES
F
G
H

Figure 18a

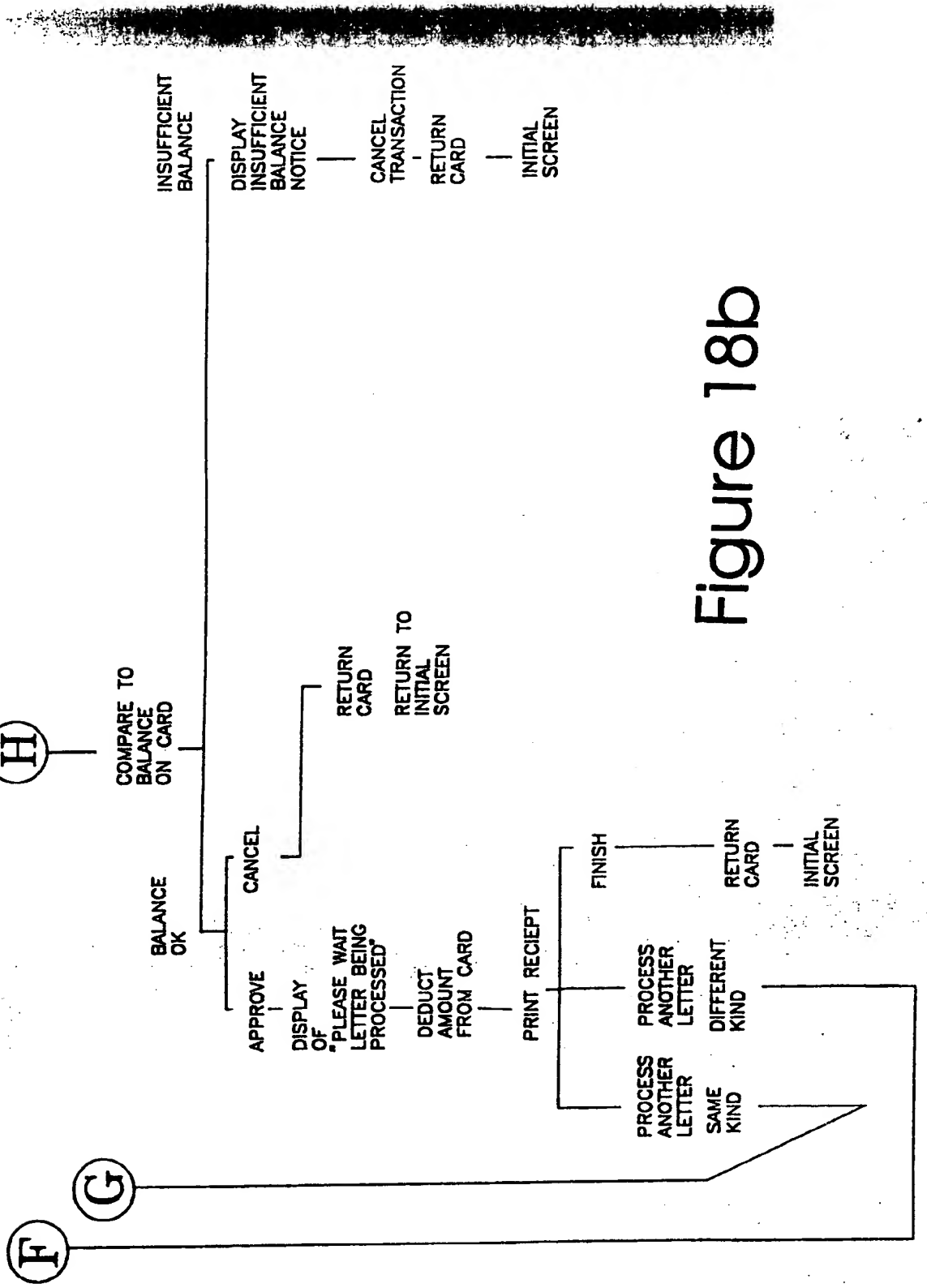

H
COMPARE TO BALANCE ON CARD
INSUFFICIENT BALANCE
DISPLAY INSUFFICIENT BALANCE NOTICE
CANCEL TRANSACTION
RETURN CARD
INITIAL SCREEN
BALANCE OK
APPROVE
DISPLAY OF "PLEASE WAIT LETTER BEING PROCESSED"
DEDUCT AMOUNT FROM CARD
PRINT RECIEPT
CANCEL
RETURN CARD
RETURN TO INITIAL SCREEN
FINISH
PROCESS ANOTHER LETTER
DIFFERENT KIND
RETURN CARD
INITIAL SCREEN
PROCESS ANOTHER LETTER
SAME KIND
G
F

Figure 18b

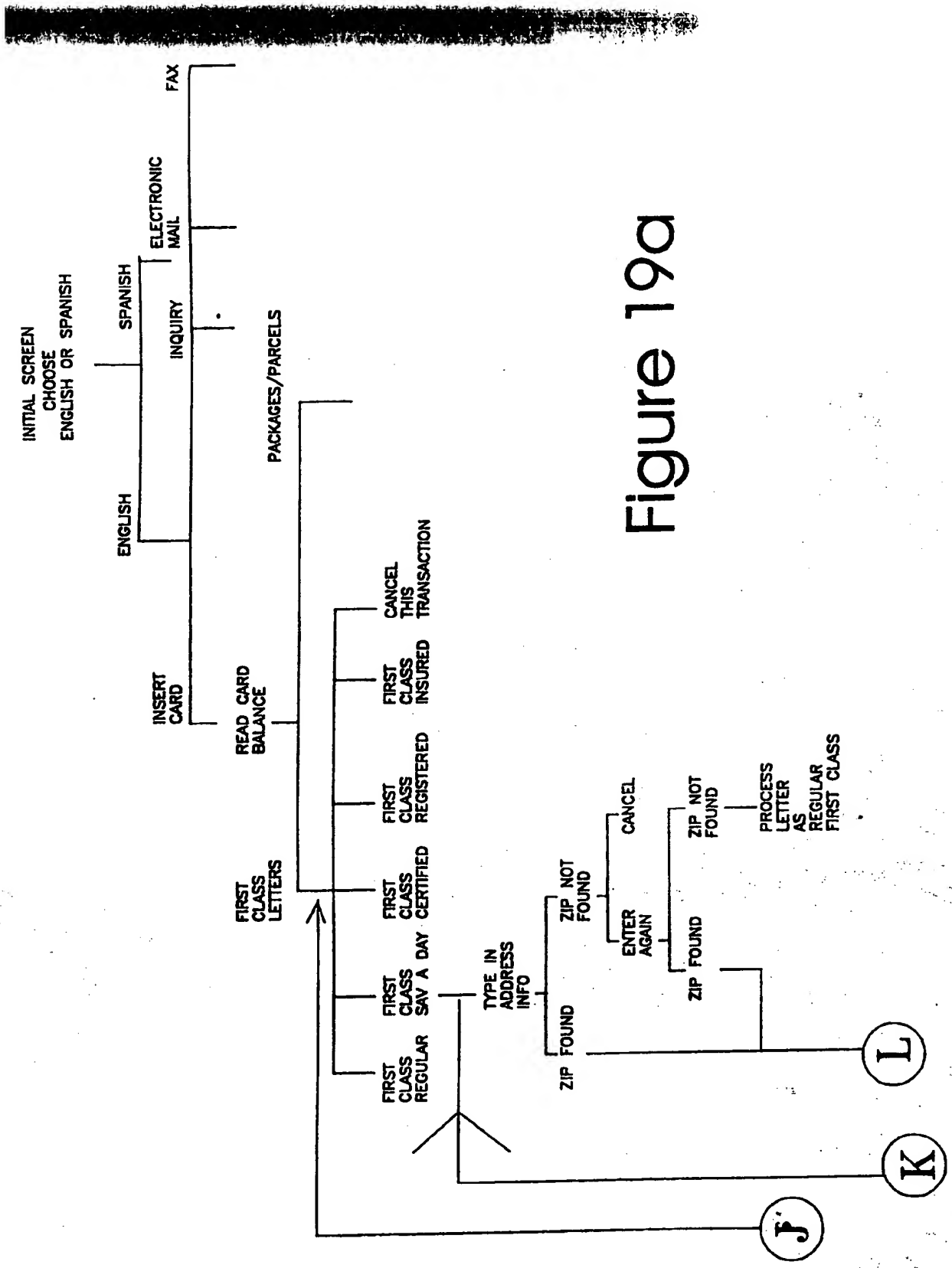

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INQUIRY
ELECTRONIC MAIL
FAX
INSERT CARD
READ CARD BALANCE
PACKAGES/PARCELS
FIRST CLASS LETTERS
FIRST CLASS REGULAR
FIRST CLASS SAV A DAY
FIRST CLASS CERTIFIED
FIRST CLASS REGISTERED
FIRST CLASS INSURED
CANCEL THIS TRANSACTION
TYPE IN ADDRESS INFO
ZIP FOUND
ZIP NOT FOUND
ENTER AGAIN
CANCEL
ZIP FOUND
ZIP NOT FOUND
PROCESS LETTER AS REGULAR FIRST CLASS
J
K
L

Figure 19a

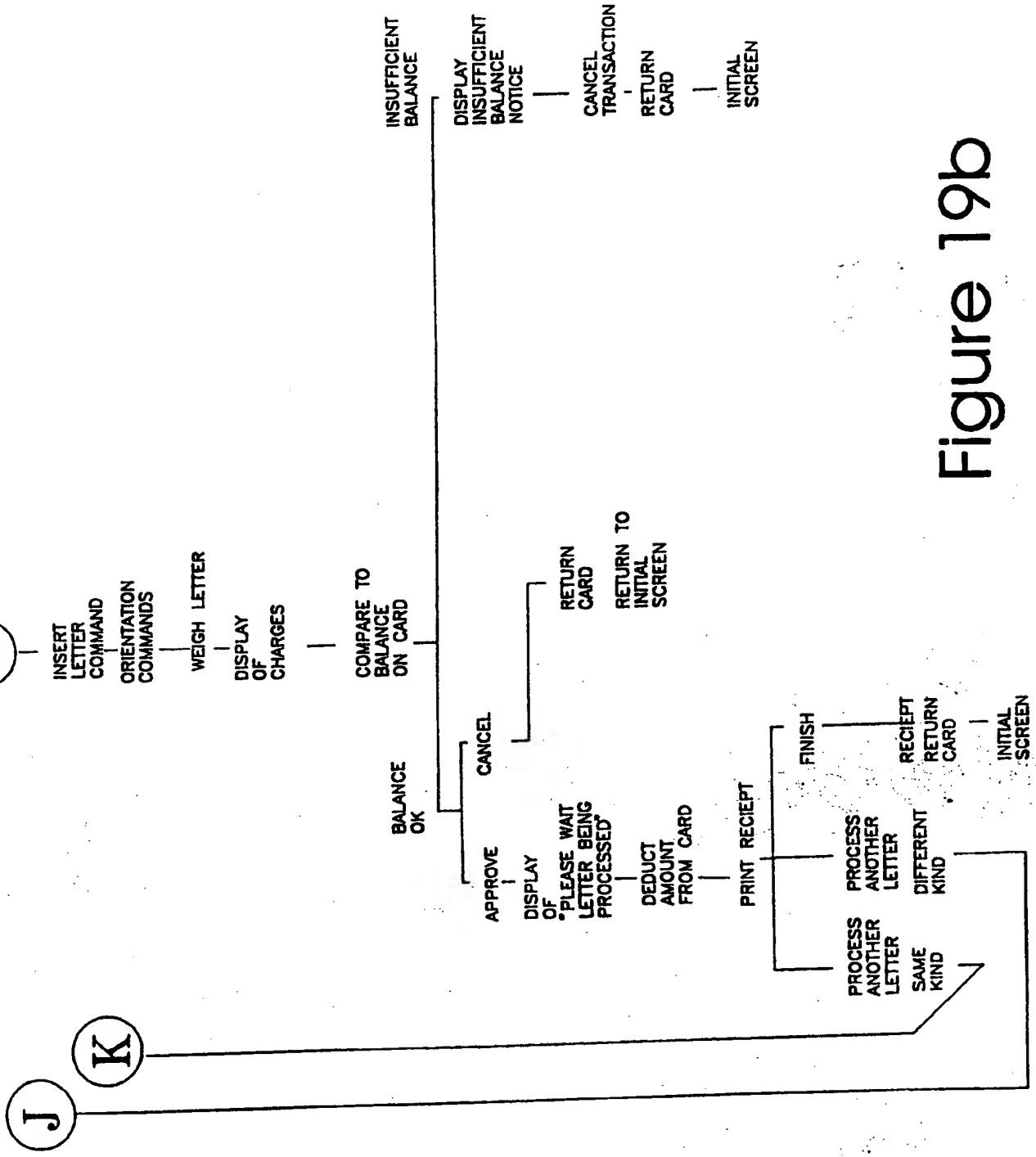

L
INSERT LETTER COMMAND
ORIENTATION COMMANDS
WEIGH LETTER
DISPLAY OF CHARGES
COMPARE TO BALANCE ON CARD
INSUFFICIENT BALANCE
DISPLAY INSUFFICIENT BALANCE NOTICE
CANCEL TRANSACTION
RETURN CARD
INITIAL SCREEN
BALANCE OK
CANCEL
RETURN CARD
APPROVE
DISPLAY OF "PLEASE WAIT LETTER BEING PROCESSED"
RETURN TO INITIAL SCREEN
DEDUCT AMOUNT FROM CARD
PRINT RECIEPT
FINISH
RECIEPT
RETURN CARD
INITIAL SCREEN
PROCESS ANOTHER LETTER
PROCESS ANOTHER LETTER
DIFFERENT KIND
SAME KIND
J
K

Figure 19b

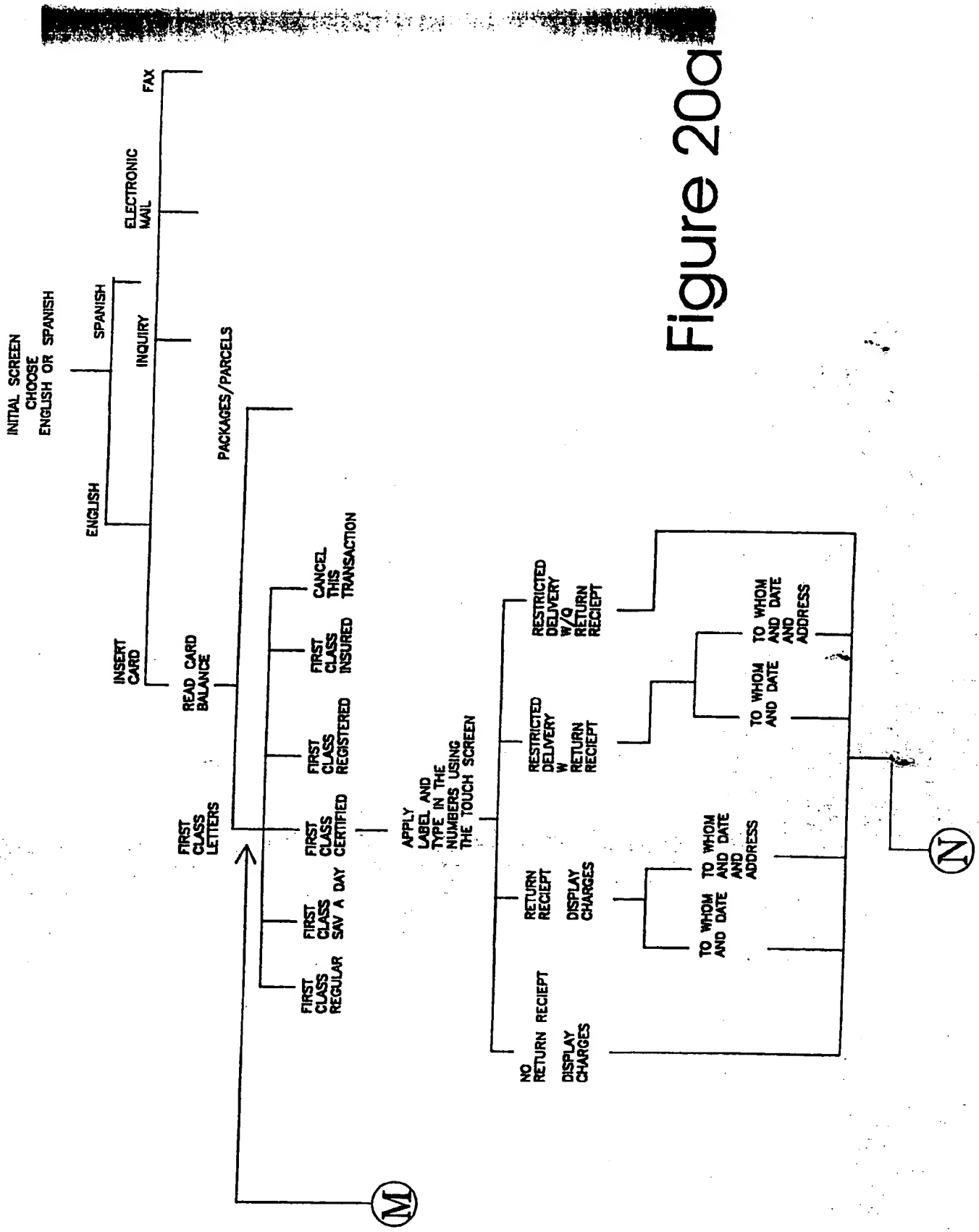

INITAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INQUIRY
ELECTRONIC MAIL
FAX
INSERT CARD
READ CARD BALANCE
PACKAGES/PARCELS
FIRST CLASS LETTERS
FIRST CLASS REGULAR
FIRST CLASS SAV A DAY
FIRST CLASS CERTIFIED
FIRST CLASS REGISTERED
FIRST CLASS INSURED
CANCEL THIS TRANSACTION
APPLY LABEL AND TYPE IN THE NUMBERS USING THE TOUCH SCREEN
NO RETURN RECIEPT
DISPLAY CHARGES
RETURN RECIEPT
DISPLAY CHARGES
TO WHOM AND DATE
TO WHOM AND DATE AND ADDRESS
RESTRICTED DELIVERY W RETURN RECIEPT
TO WHOM AND DATE
TO WHOM AND DATE AND ADDRESS
RESTRICTED DELIVERY W/O RETURN RECIEPT
M
N

Figure 20a

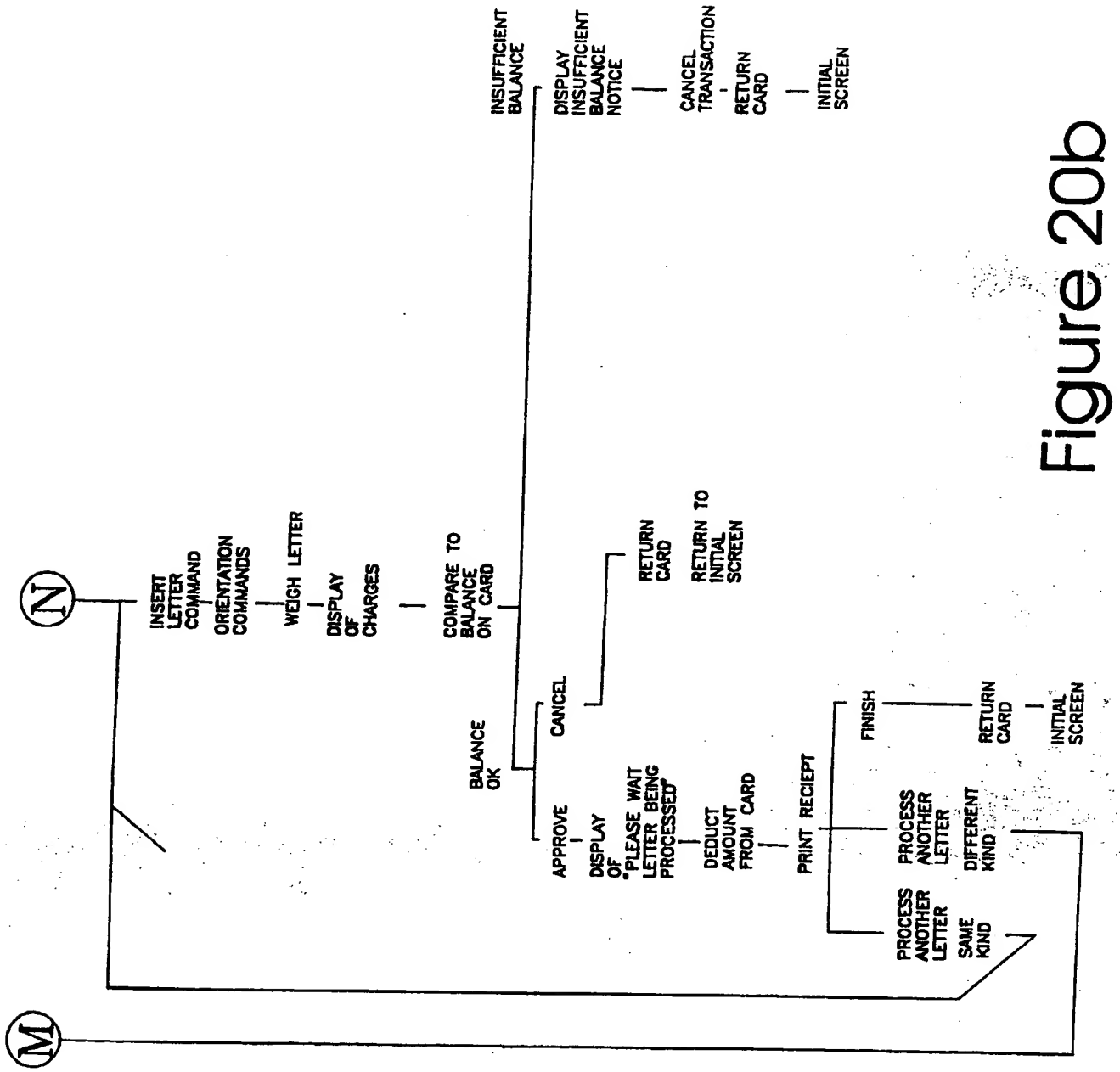

N
INSERT LETTER COMMAND
ORIENTATION COMMANDS
WEIGH LETTER
DISPLAY OF CHARGES
COMPARE TO BALANCE ON CARD
INSUFFICIENT BALANCE
DISPLAY INSUFFICIENT BALANCE NOTICE
CANCEL TRANSACTION
RETURN CARD
INITIAL SCREEN
BALANCE OK
CANCEL
RETURN CARD
RETURN TO INITIAL SCREEN
APPROVE
DISPLAY OF "PLEASE WAIT LETTER BEING PROCESSED"
DEDUCT AMOUNT FROM CARD
PRINT RECIEPT
FINISH
RETURN CARD
INITIAL SCREEN
PROCESS ANOTHER LETTER
DIFFERENT KIND
PROCESS ANOTHER LETTER
SAME KIND
M

Figure 20b

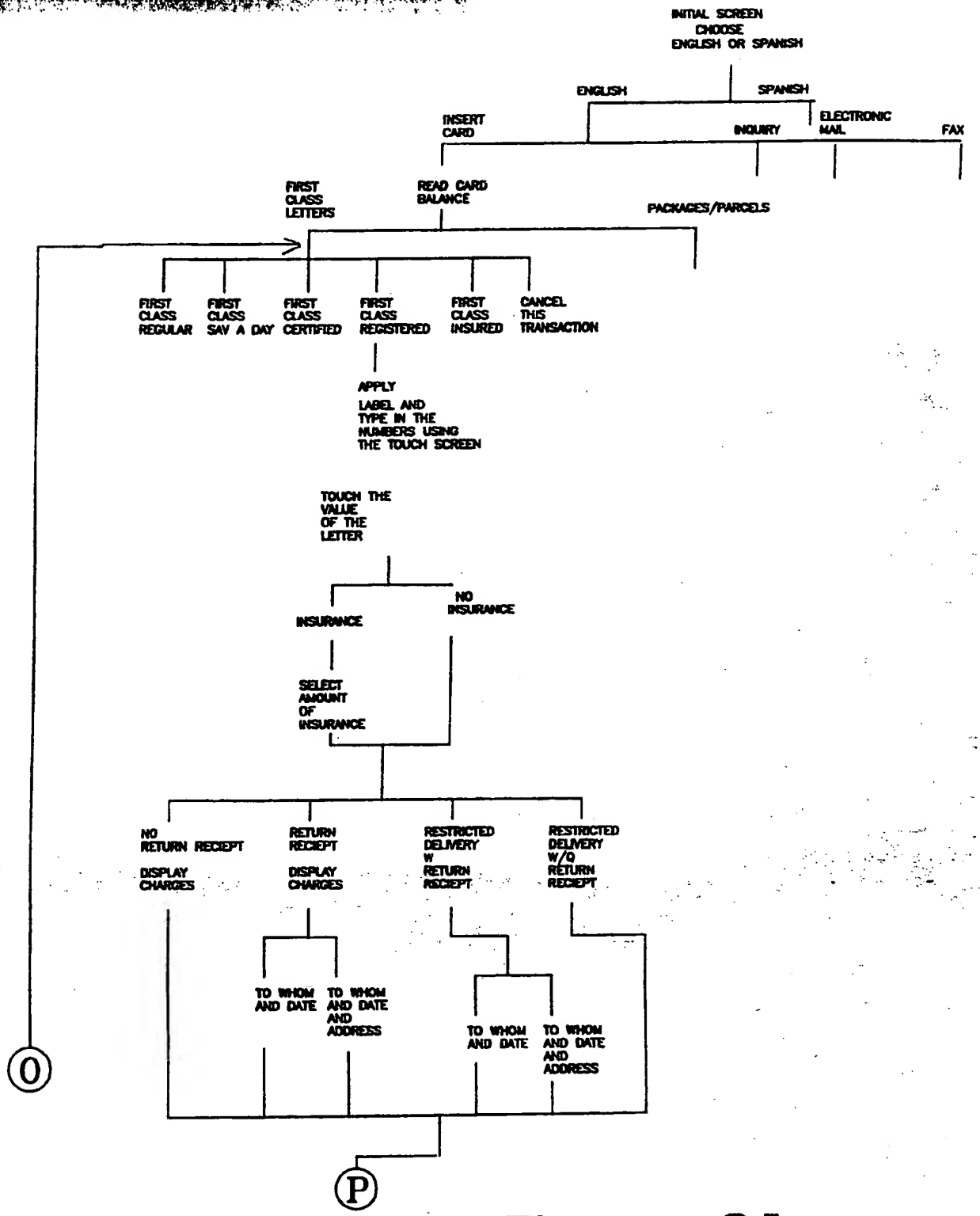

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INSERT CARD
INQUIRY
ELECTRONIC MAIL
FAX
READ CARD BALANCE
FIRST CLASS LETTERS
PACKAGES/PARCELS
FIRST CLASS REGULAR
FIRST CLASS SAV A DAY
FIRST CLASS CERTIFIED
FIRST CLASS REGISTERED
FIRST CLASS INSURED
CANCEL THIS TRANSACTION
APPLY
LABEL AND TYPE IN THE NUMBERS USING THE TOUCH SCREEN
TOUCH THE VALUE OF THE LETTER
INSURANCE
NO INSURANCE
SELECT AMOUNT OF INSURANCE
NO RETURN RECIEPT
DISPLAY CHARGES
RETURN RECIEPT
DISPLAY CHARGES
RESTRICTED DELIVERY W RETURN RECIEPT
RESTRICTED DELIVERY W/O RETURN RECIEPT
TO WHOM AND DATE
TO WHOM AND DATE AND ADDRESS
TO WHOM AND DATE
TO WHOM AND DATE AND ADDRESS
O
P

Figure 21a

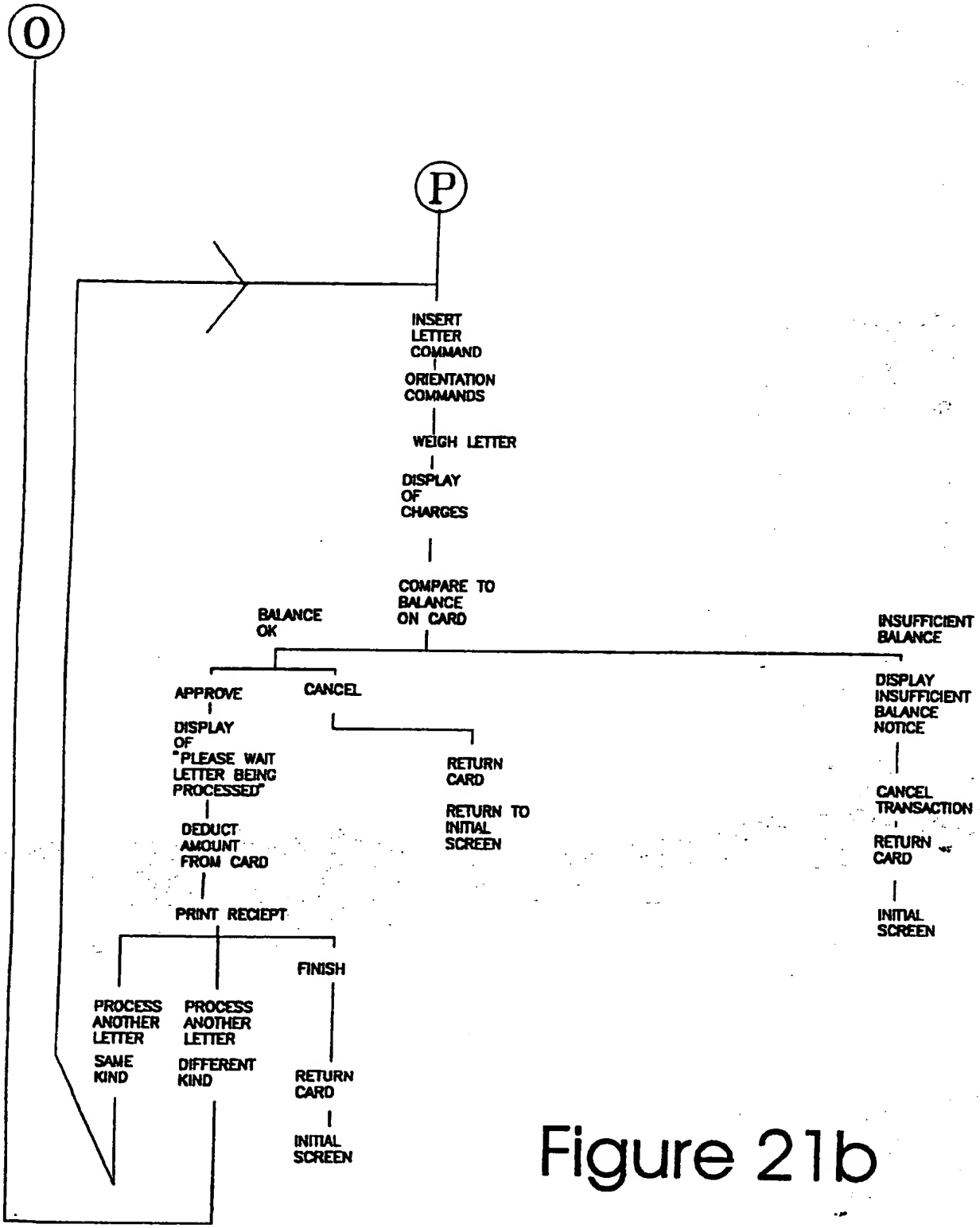

0
P
INSERT LETTER COMMAND
ORIENTATION COMMANDS
WEIGH LETTER
DISPLAY OF CHARGES
COMPARE TO BALANCE ON CARD
BALANCE OK
INSUFFICIENT BALANCE
APPROVE
CANCEL
DISPLAY OF "PLEASE WAIT LETTER BEING PROCESSED"
DEDUCT AMOUNT FROM CARD
PRINT RECIEPT
RETURN CARD
RETURN TO INITIAL SCREEN
DISPLAY INSUFFICIENT BALANCE NOTICE
CANCEL TRANSACTION
RETURN CARD
INITIAL SCREEN
FINISH
PROCESS ANOTHER LETTER SAME KIND
PROCESS ANOTHER LETTER DIFFERENT KIND
RETURN CARD
INITIAL SCREEN

Figure 21b

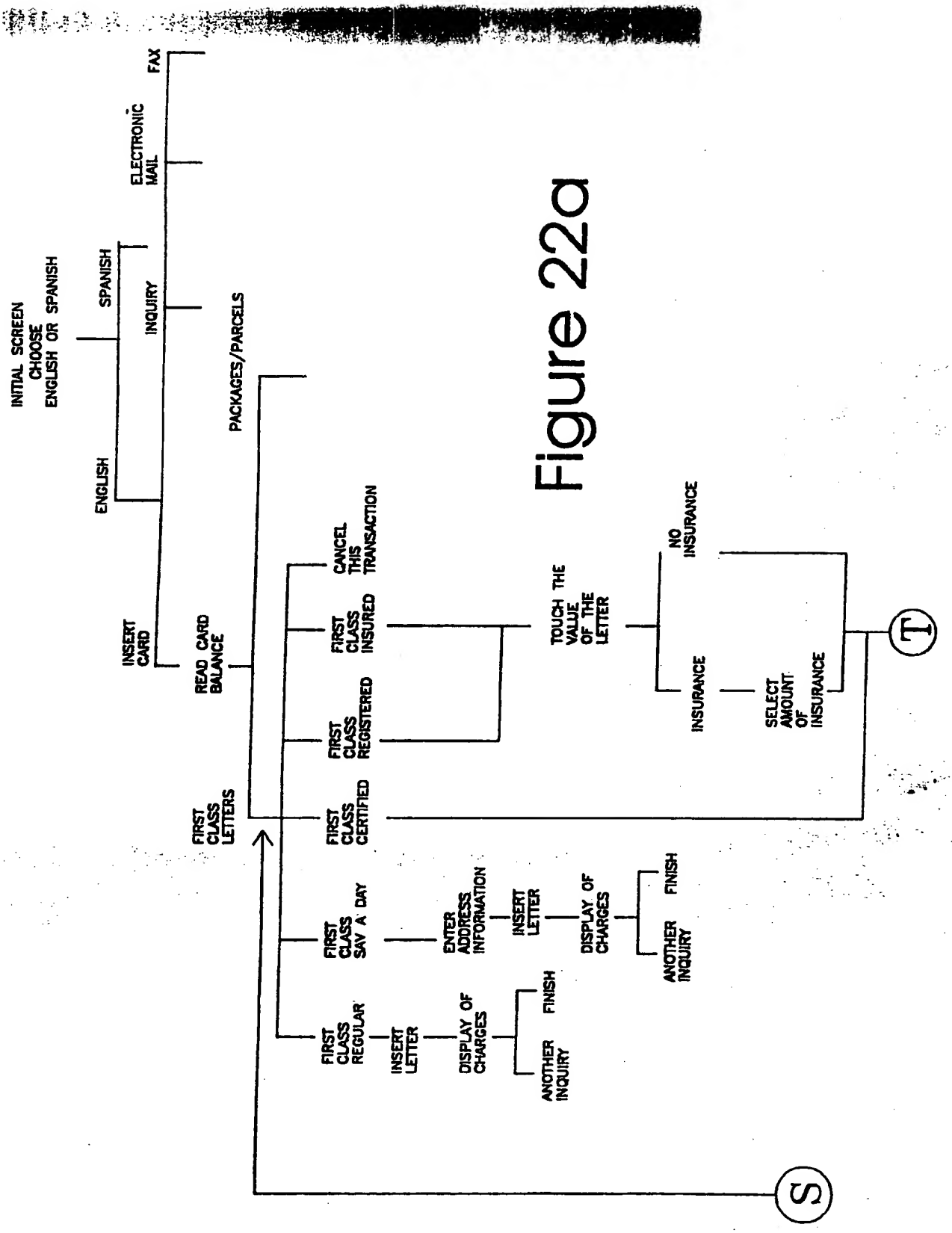

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INQUIRY
ELECTRONIC MAIL
FAX
INSERT CARD
READ CARD BALANCE
PACKAGES/PARCELS
FIRST CLASS LETTERS
CANCEL THIS TRANSACTION
FIRST CLASS INSURED
FIRST CLASS REGISTERED
FIRST CLASS CERTIFIED
TOUCH THE VALUE OF THE LETTER
NO INSURANCE
INSURANCE
SELECT AMOUNT OF INSURANCE
T
FIRST CLASS SAV A DAY
ENTER ADDRESS INFORMATION
INSERT LETTER
DISPLAY OF CHARGES
FINISH
ANOTHER INQUIRY
FIRST CLASS REGULAR
INSERT LETTER
DISPLAY OF CHARGES
FINISH
ANOTHER INQUIRY
S

Figure 22a

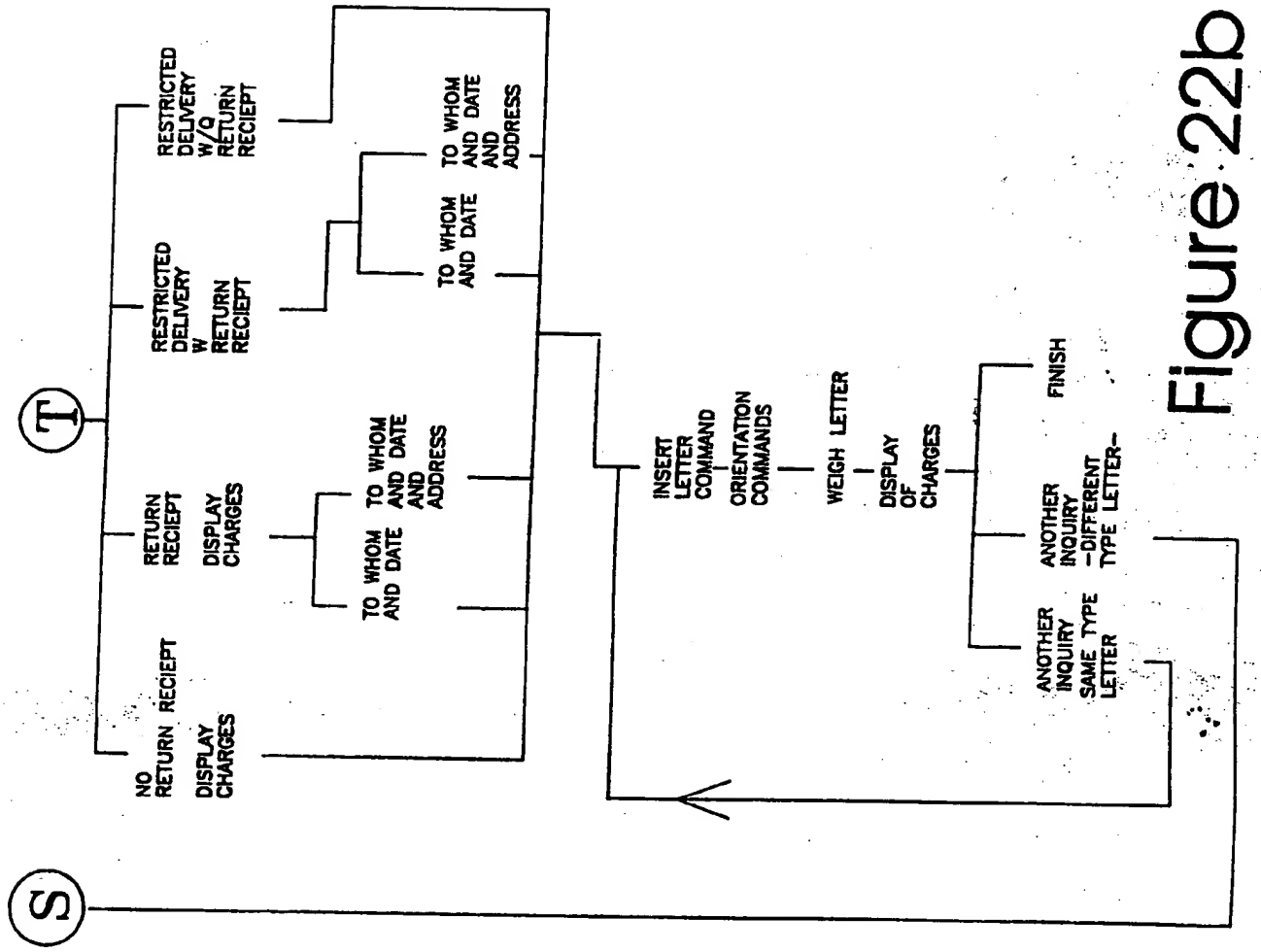

T
S
NO RETURN RECIEPT
DISPLAY CHARGES
RETURN RECIEPT
DISPLAY CHARGES
TO WHOM AND DATE
TO WHOM AND DATE AND ADDRESS
RESTRICTED DELIVERY W/O RETURN RECIEPT
RESTRICTED DELIVERY W RETURN RECIEPT
TO WHOM AND DATE
TO WHOM AND DATE AND ADDRESS
INSERT LETTER COMMAND
ORIENTATION COMMANDS
WEIGH LETTER
DISPLAY OF CHARGES
FINISH
ANOTHER INQUIRY -DIFFERENT TYPE LETTER-
ANOTHER INQUIRY SAME TYPE LETTER

Figure 22b

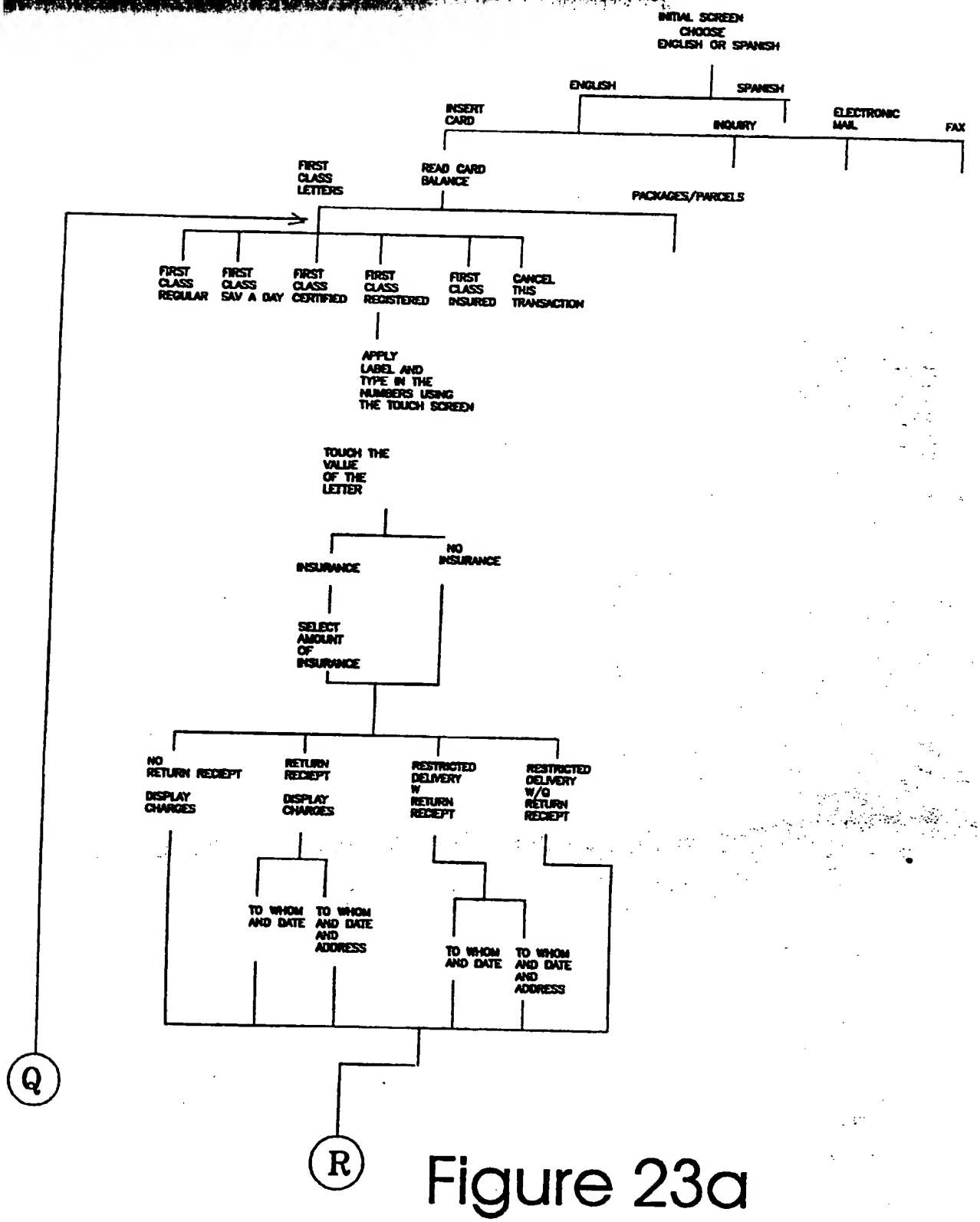

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INSERT
CARD
INQUIRY
ELECTRONIC
MAIL
FAX
FIRST
CLASS
LETTERS
READ CARD
BALANCE
PACKAGES/PARCELS
FIRST
CLASS
REGULAR
FIRST
CLASS
SAV A DAY
FIRST
CLASS
CERTIFIED
FIRST
CLASS
REGISTERED
FIRST
CLASS
INSURED
CANCEL
THIS
TRANSACTION
APPLY
LABEL AND
TYPE IN THE
NUMBERS USING
THE TOUCH SCREEN
TOUCH THE
VALUE
OF THE
LETTER
INSURANCE
NO
INSURANCE
SELECT
AMOUNT
OF
INSURANCE
NO
RETURN RECIEPT
DISPLAY
CHARGES
RETURN
RECIEPT
DISPLAY
CHARGES
RESTRICTED
DELIVERY
W
RETURN
RECIEPT
RESTRICTED
DELIVERY
W/O
RETURN
RECIEPT
TO WHOM
AND DATE
TO WHOM
AND DATE
AND
ADDRESS
TO WHOM
AND DATE
TO WHOM
AND DATE
AND
ADDRESS
Q
R

Figure 23a

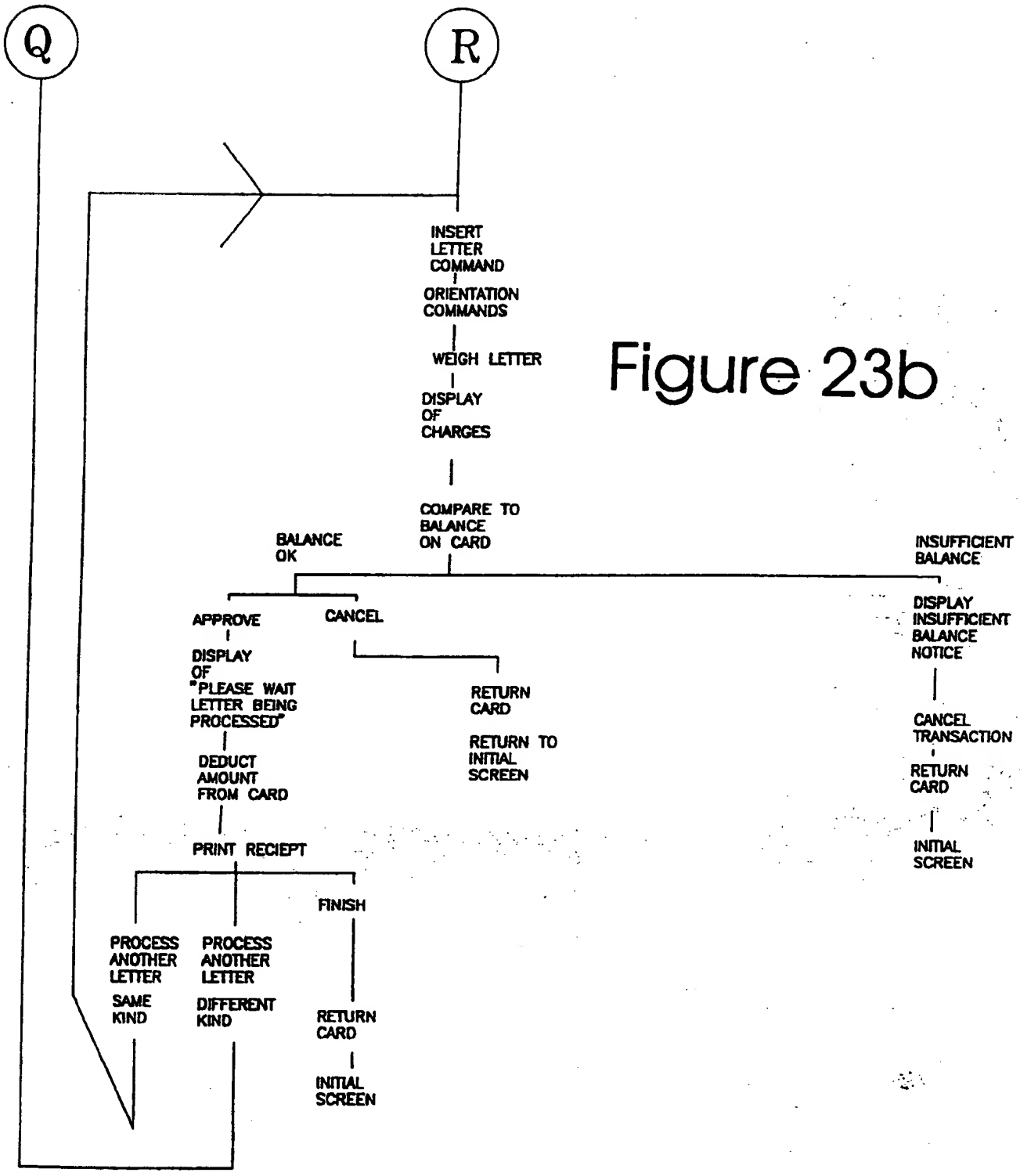

Q
R
INSERT LETTER COMMAND
ORIENTATION COMMANDS
WEIGH LETTER
DISPLAY OF CHARGES
COMPARE TO BALANCE ON CARD
BALANCE OK
INSUFFICIENT BALANCE
APPROVE
CANCEL
DISPLAY OF "PLEASE WAIT LETTER BEING PROCESSED"
DEDUCT AMOUNT FROM CARD
PRINT RECIEPT
RETURN CARD
RETURN TO INITIAL SCREEN
DISPLAY INSUFFICIENT BALANCE NOTICE
CANCEL TRANSACTION
RETURN CARD
INITIAL SCREEN
FINISH
PROCESS ANOTHER LETTER SAME KIND
PROCESS ANOTHER LETTER DIFFERENT KIND
RETURN CARD
INITIAL SCREEN

Figure 23b

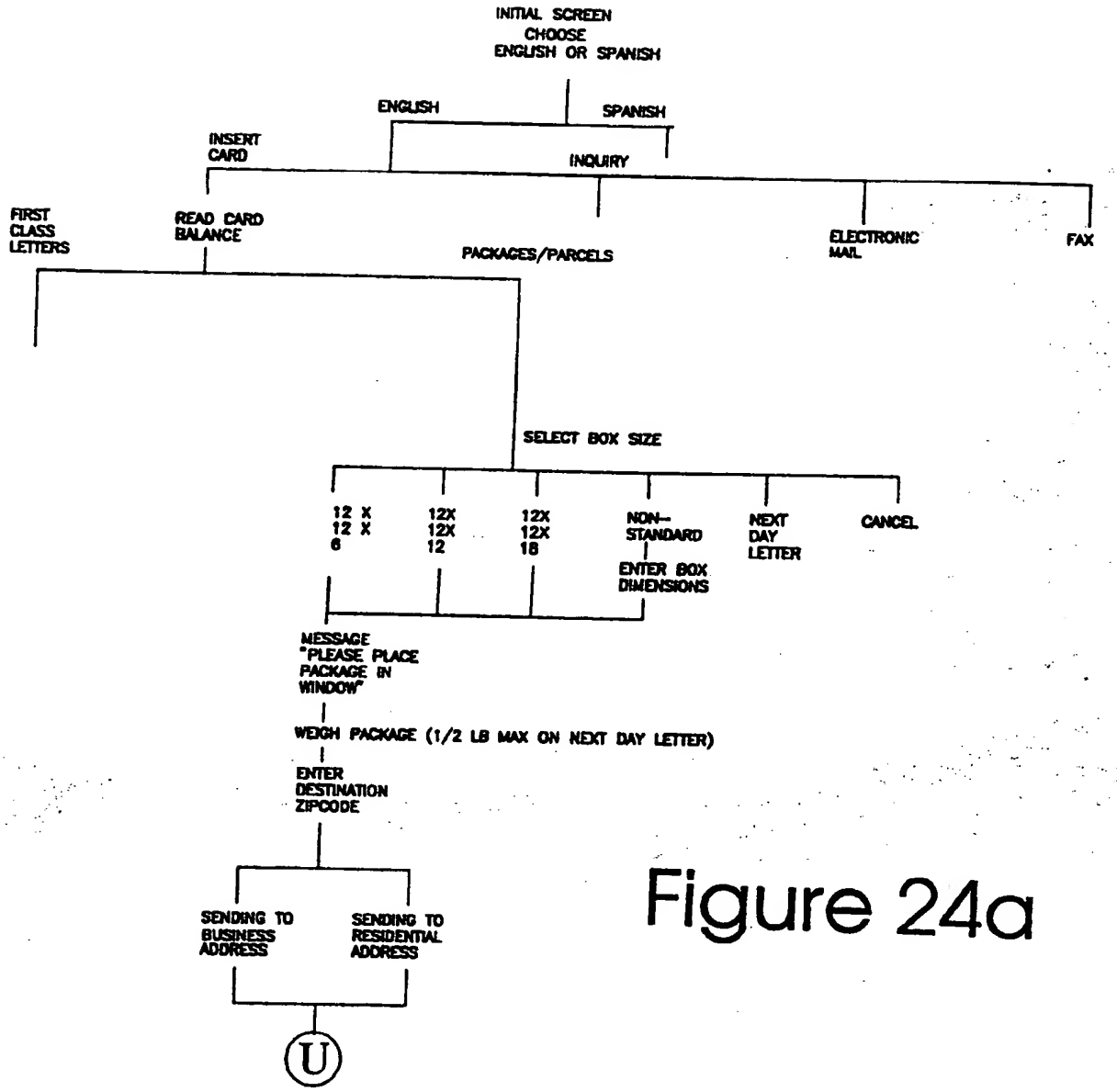

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INSERT
CARD
INQUIRY
FIRST
CLASS
LETTERS
READ CARD
BALANCE
PACKAGES/PARCELS
ELECTRONIC
MAIL
FAX
SELECT BOX SIZE
12 X
12 X
6
12X
12X
12
12X
12X
18
NON-
STANDARD
NEXT
DAY
LETTER
CANCEL
ENTER BOX
DIMENSIONS
MESSAGE
"PLEASE PLACE
PACKAGE IN
WINDOW"
WEIGH PACKAGE (1/2 LB MAX ON NEXT DAY LETTER)
ENTER
DESTINATION
ZIPCODE
SENDING TO
BUSINESS
ADDRESS
SENDING TO
RESIDENTIAL
ADDRESS
U

Figure 24a

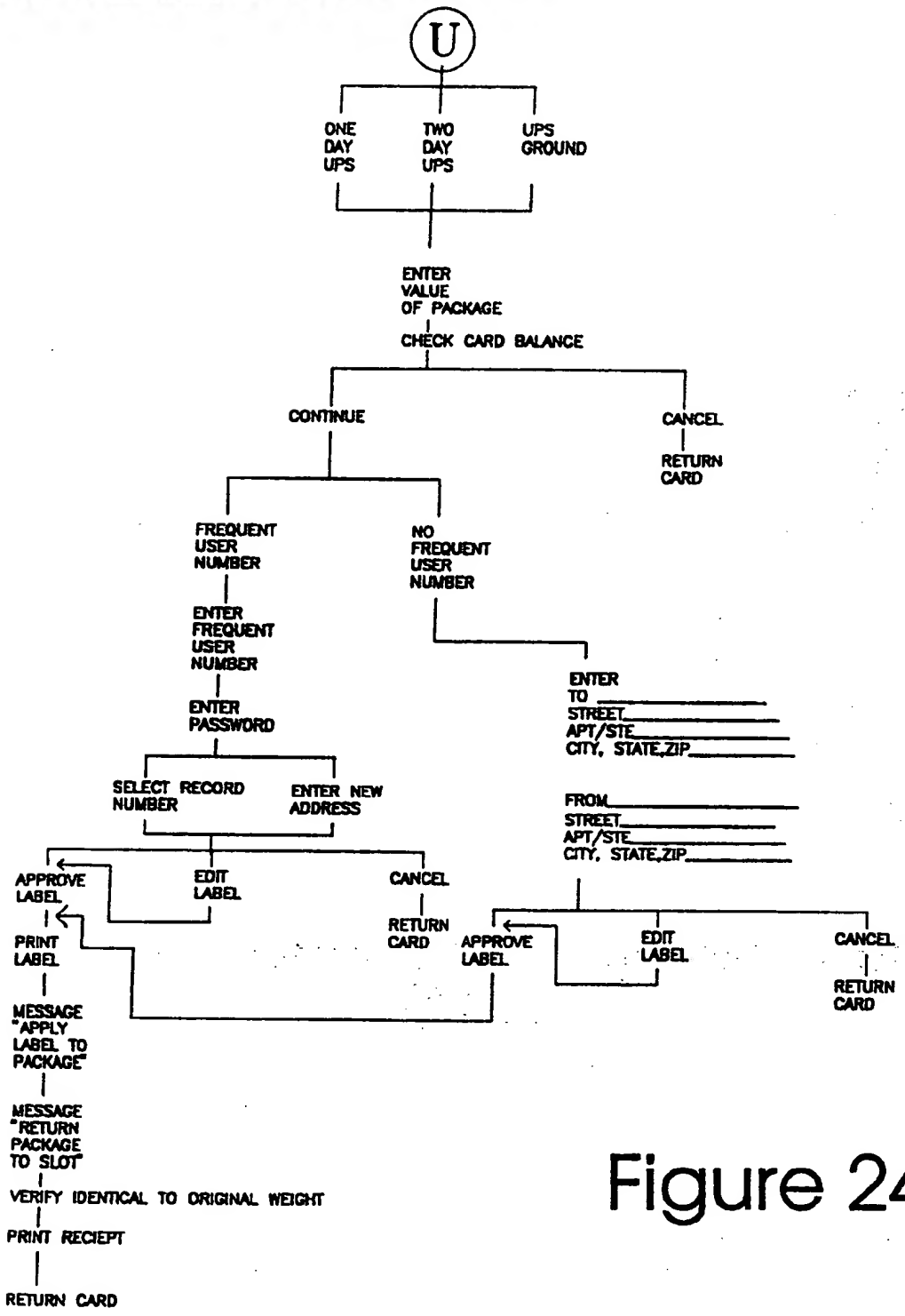

U
ONE DAY UPS
TWO DAY UPS
UPS GROUND
ENTER VALUE OF PACKAGE
CHECK CARD BALANCE
CONTINUE
CANCEL
RETURN CARD
FREQUENT USER NUMBER
NO FREQUENT USER NUMBER
ENTER FREQUENT USER NUMBER
ENTER PASSWORD
SELECT RECORD NUMBER
ENTER NEW ADDRESS
ENTER
TO
STREET
APT/STE
CITY, STATE,ZIP
FROM
STREET
APT/STE
CITY, STATE,ZIP
APPROVE LABEL
EDIT LABEL
CANCEL
RETURN CARD
PRINT LABEL
MESSAGE "APPLY LABEL TO PACKAGE"
MESSAGE "RETURN PACKAGE TO SLOT"
VERIFY IDENTICAL TO ORIGINAL WEIGHT
PRINT RECIEPT
RETURN CARD
APPROVE LABEL
EDIT LABEL
CANCEL
RETURN CARD

Figure 24b

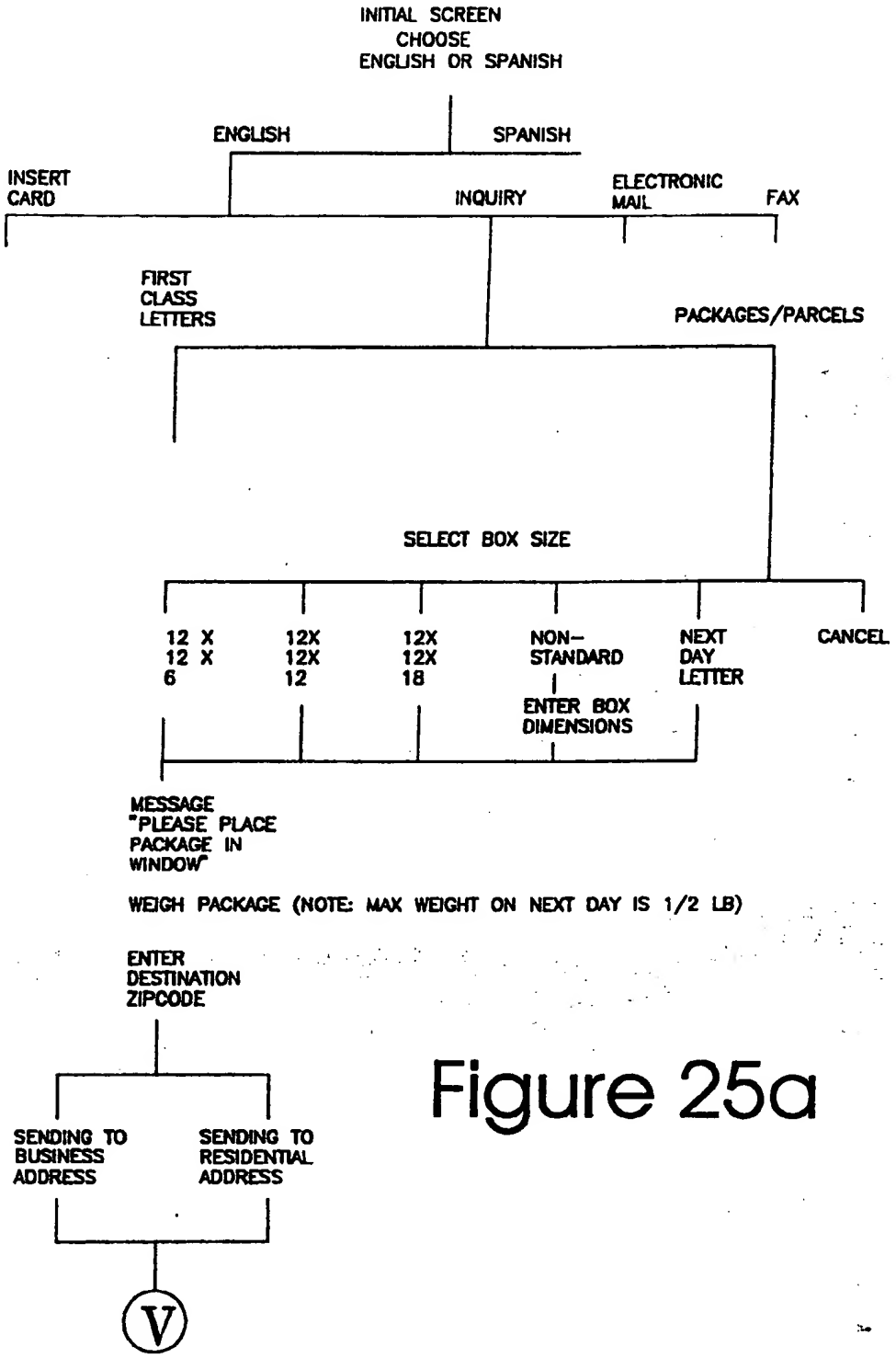

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INSERT
CARD
INQUIRY
ELECTRONIC
MAIL
FAX
FIRST
CLASS
LETTERS
PACKAGES/PARCELS
SELECT BOX SIZE
12 X
12 X
6
12X
12X
12
12X
12X
18
NON-
STANDARD
ENTER BOX
DIMENSIONS
NEXT
DAY
LETTER
CANCEL
MESSAGE
"PLEASE PLACE
PACKAGE IN
WINDOW"
WEIGH PACKAGE (NOTE: MAX WEIGHT ON NEXT DAY IS 1/2 LB)
ENTER
DESTINATION
ZIPCODE
SENDING TO
BUSINESS
ADDRESS
SENDING TO
RESIDENTIAL
ADDRESS
V

Figure 25a

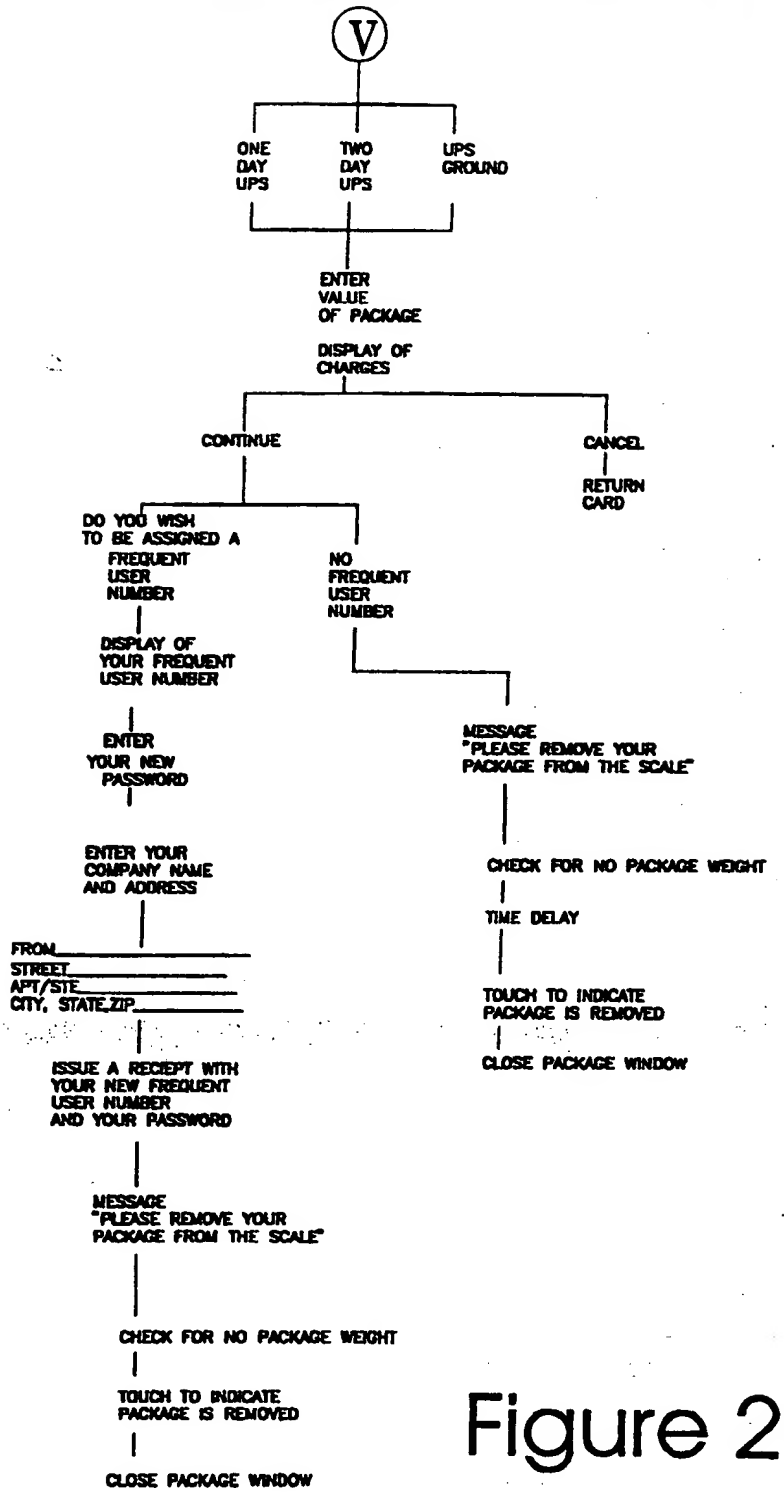

V
ONE DAY UPS
TWO DAY UPS
UPS GROUND
ENTER VALUE OF PACKAGE
DISPLAY OF CHARGES
CONTINUE
CANCEL
RETURN CARD
DO YOU WISH TO BE ASSIGNED A FREQUENT USER NUMBER
NO FREQUENT USER NUMBER
DISPLAY OF YOUR FREQUENT USER NUMBER
ENTER YOUR NEW PASSWORD
ENTER YOUR COMPANY NAME AND ADDRESS
FROM
STREET
APT/STE
CITY, STATE,ZIP
ISSUE A RECIEPT WITH YOUR NEW FREQUENT USER NUMBER AND YOUR PASSWORD
MESSAGE "PLEASE REMOVE YOUR PACKAGE FROM THE SCALE"
CHECK FOR NO PACKAGE WEIGHT
TOUCH TO INDICATE PACKAGE IS REMOVED
CLOSE PACKAGE WINDOW
MESSAGE "PLEASE REMOVE YOUR PACKAGE FROM THE SCALE"
CHECK FOR NO PACKAGE WEIGHT
TIME DELAY
TOUCH TO INDICATE PACKAGE IS REMOVED
CLOSE PACKAGE WINDOW

Figure 25b

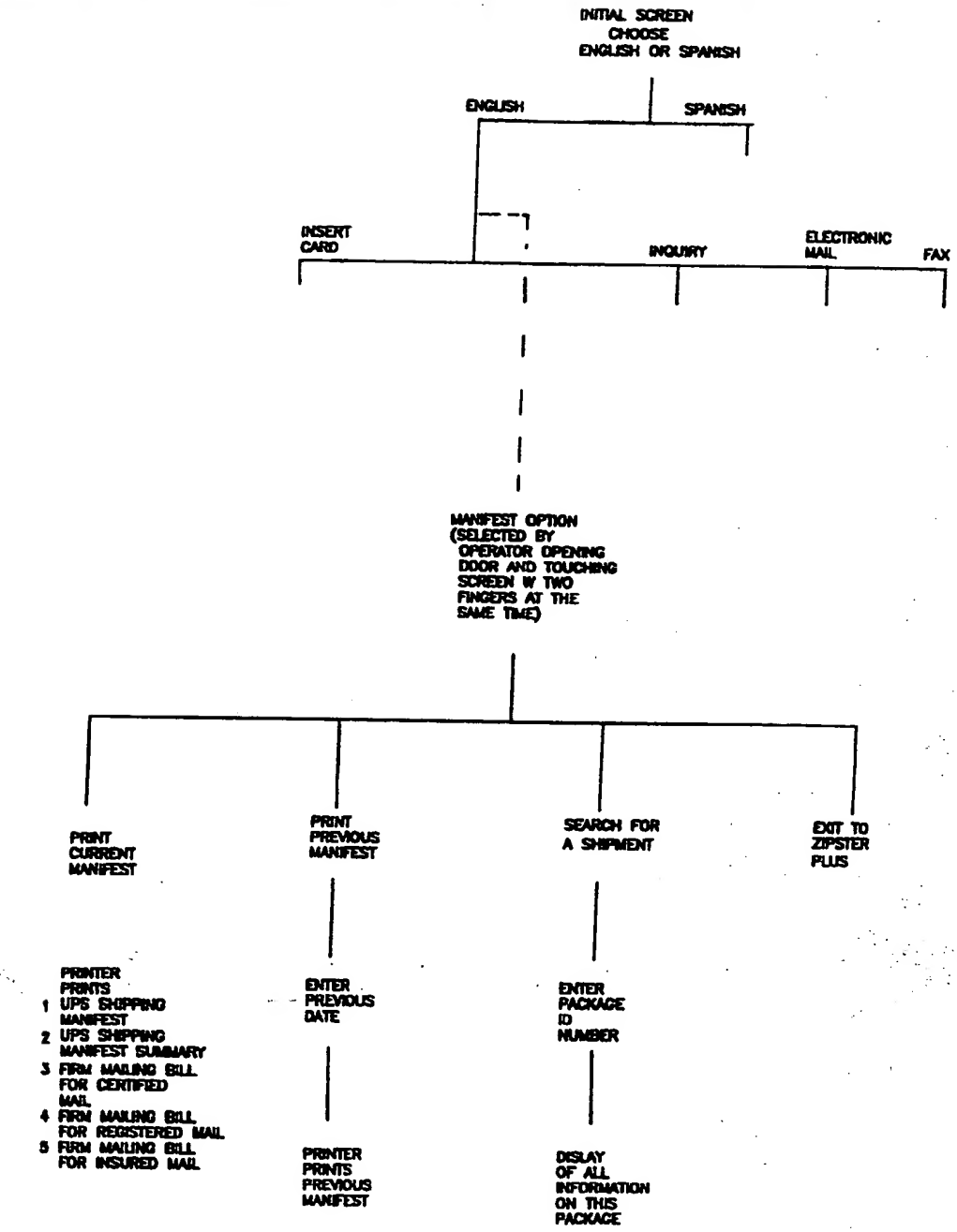

INITIAL SCREEN
CHOOSE
ENGLISH OR SPANISH
ENGLISH
SPANISH
INSERT
CARD
INQUIRY
ELECTRONIC
MAIL
FAX
MANIFEST OPTION
(SELECTED BY
OPERATOR OPENING
DOOR AND TOUCHING
SCREEN W TWO
FINGERS AT THE
SAME TIME)
PRINT
CURRENT
MANIFEST
PRINT
PREVIOUS
MANIFEST
SEARCH FOR
A SHIPMENT
EXIT TO
ZIPSTER
PLUS
PRINTER
PRINTS
1 UPS SHIPPING
MANIFEST
2 UPS SHIPPING
MANIFEST SUMMARY
3 FIRM MAILING BILL
FOR CERTIFIED
MAIL
4 FIRM MAILING BILL
FOR REGISTERED MAIL
5 FIRM MAILING BILL
FOR INSURED MAIL
ENTER
PREVIOUS
DATE
PRINTER
PRINTS
PREVIOUS
MANIFEST
ENTER
PACKAGE
ID
NUMBER
DISLAY
OF ALL
INFORMATION
ON THIS
PACKAGE

Figure 26

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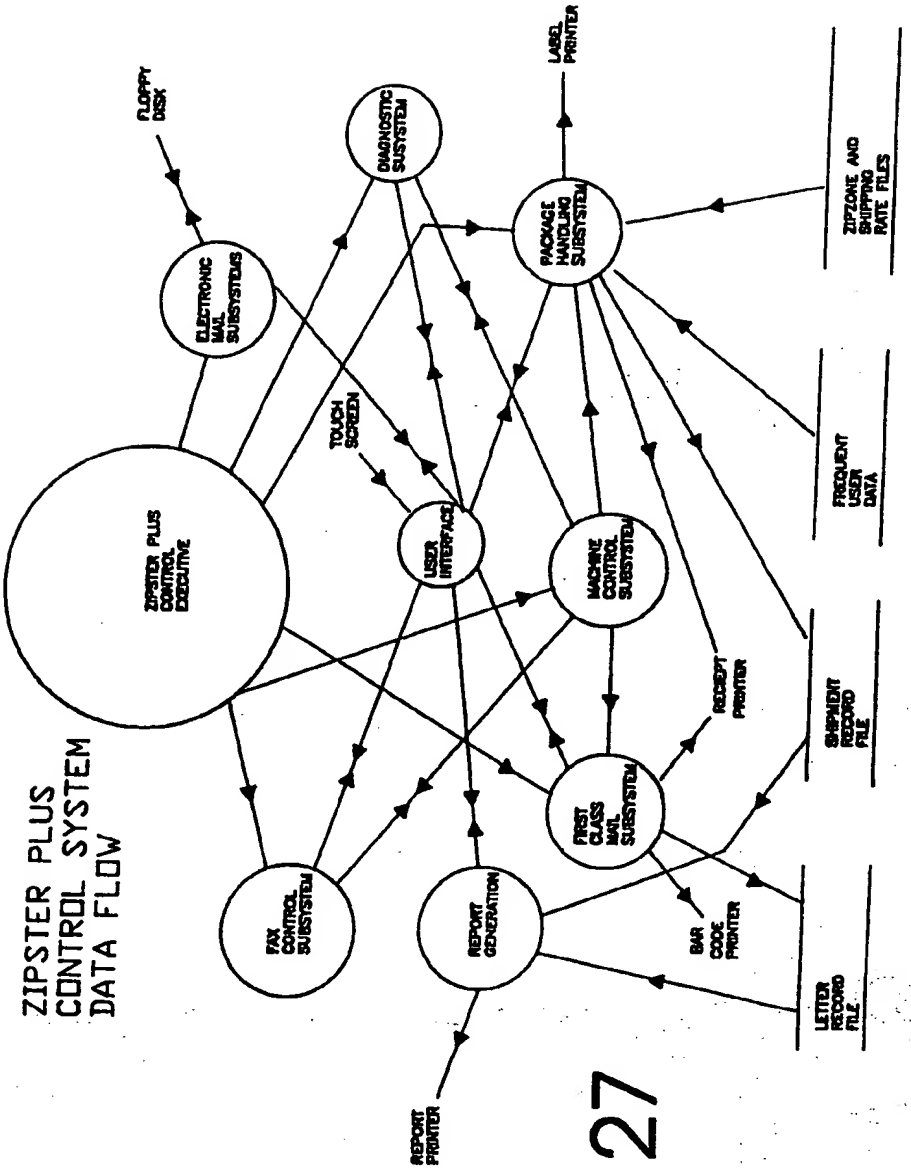

Figure 27

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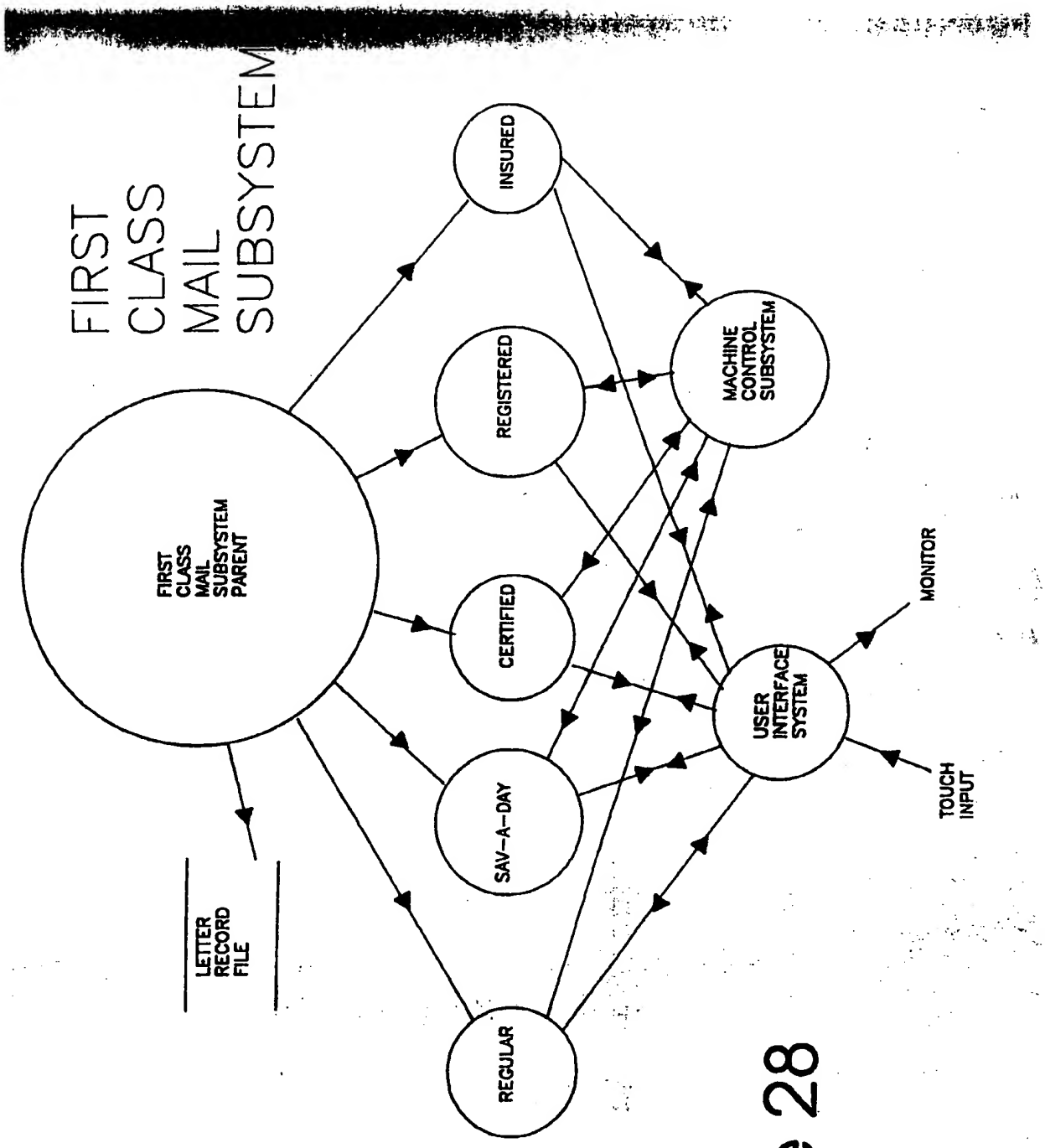

Figure 28

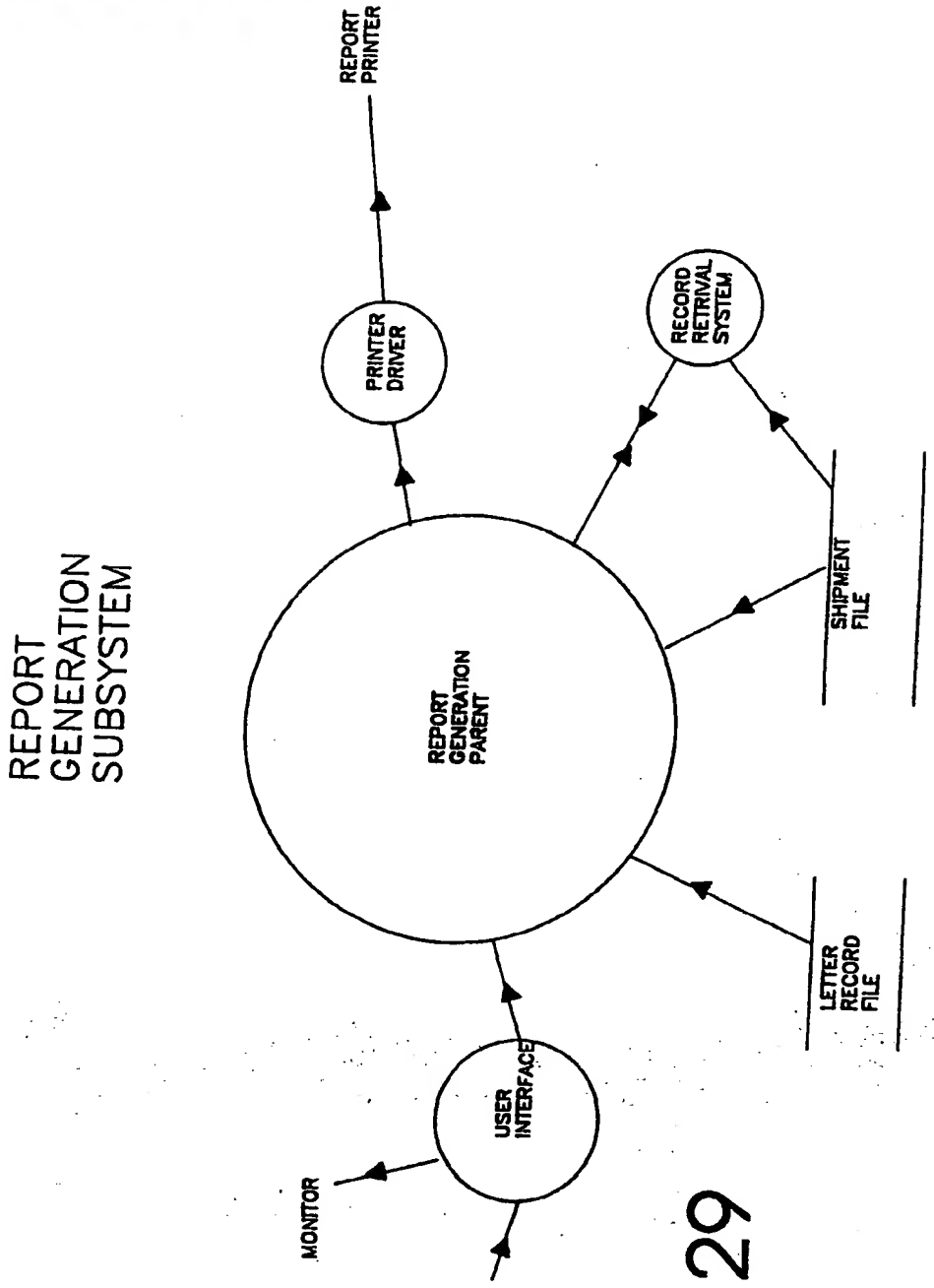
REPORT GENERATION SUBSYSTEM
REPORT PRINTER
PRINTER DRIVER
RECORD RETRIVAL SYSTEM
SHIPMENT FILE
REPORT GENERATION PARENT
LETTER RECORD FILE
USER INTERFACE
MONITOR

Figure 29

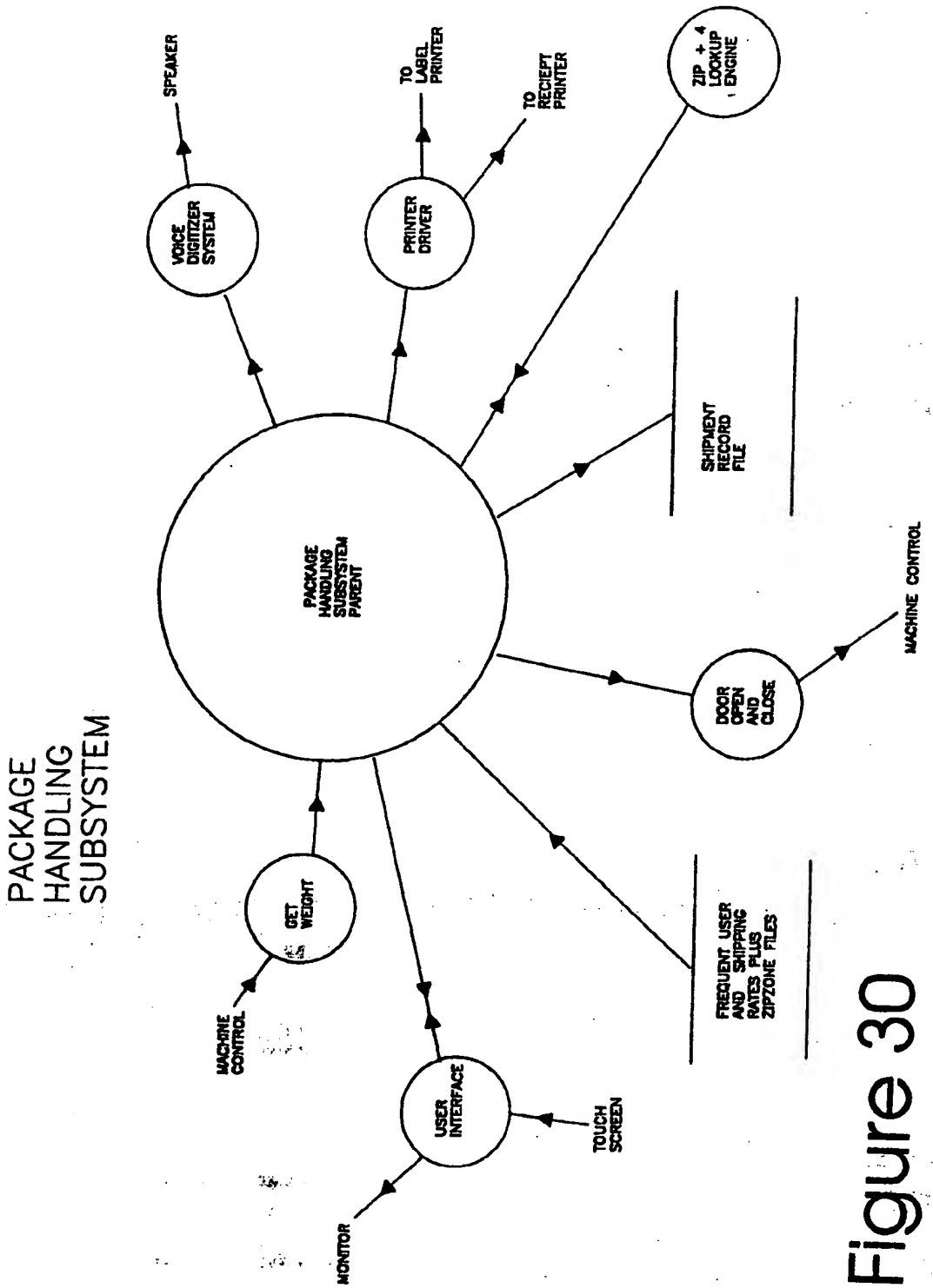
PACKAGE HANDLING SUBSYSTEM
PACKAGE HANDLING SUBSYSTEM PARENT
VOICE DIGITIZER SYSTEM
SPEAKER
PRINTER DRIVER
TO LABEL PRINTER
TO RECIEPT PRINTER
ZIP + 4 LOOKUP ENGINE
SHIPMENT RECORD FILE
DOOR OPEN AND CLOSE
MACHINE CONTROL
FREQUENT USER AND SHIPPING RATES PLUS ZIPZONE FILES
GET WEIGHT
MACHINE CONTROL
USER INTERFACE
TOUCH SCREEN
MONITOR

Figure 30

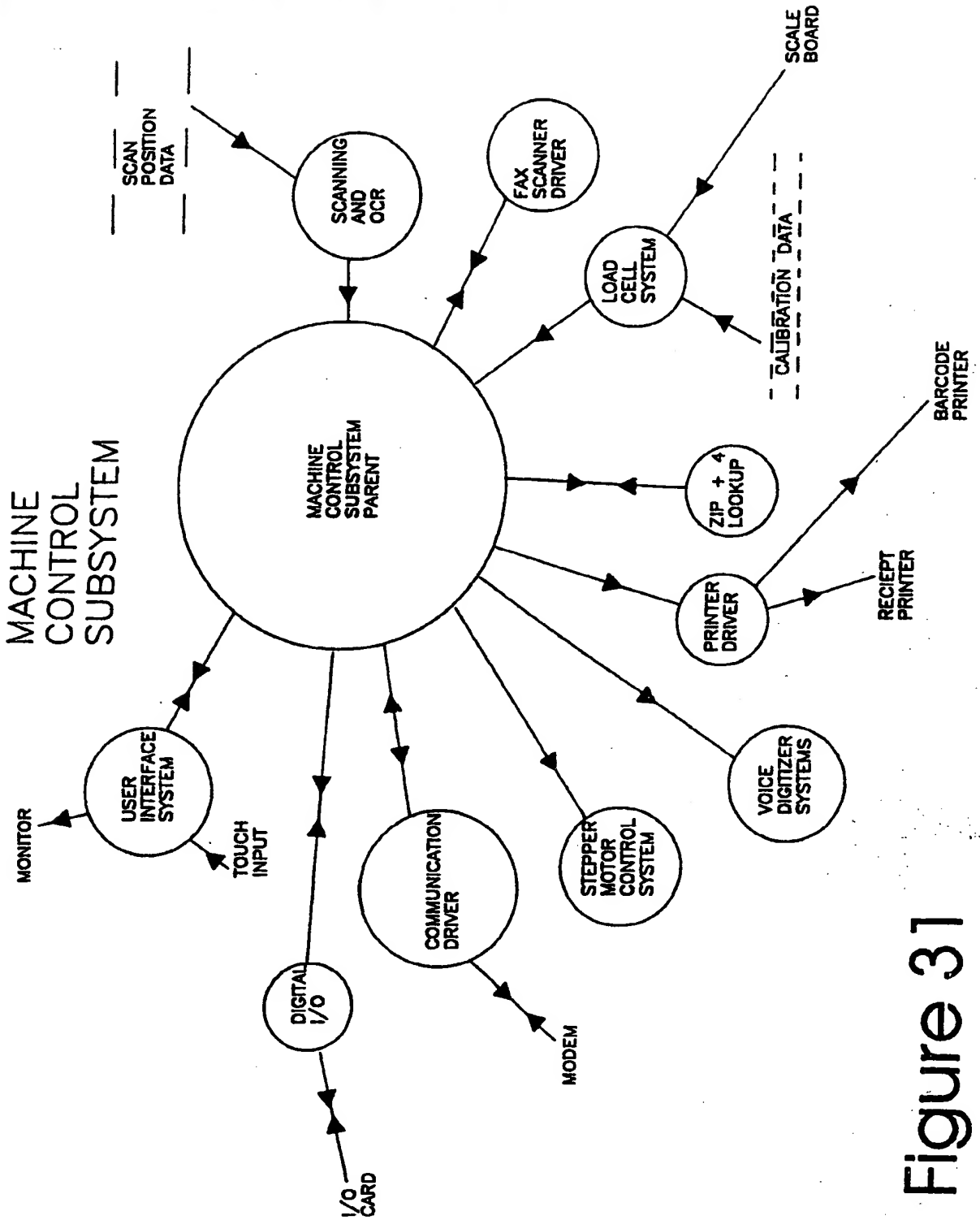
MACHINE CONTROL SUBSYSTEM
MACHINE CONTROL SUBSYSTEM PARENT
SCANNING AND OCR
SCAN POSITION DATA
FAX SCANNER DRIVER
LOAD CELL SYSTEM
SCALE BOARD
CALIBRATION DATA
ZIP + 4 LOOKUP
PRINTER DRIVER
BARCODE PRINTER
RECIEPT PRINTER
VOICE DIGITIZER SYSTEMS
STEPPER MOTOR CONTROL SYSTEM
COMMUNICATION DRIVER
MODEM
DIGITAL I/O
I/O CARD
USER INTERFACE SYSTEM
MONITOR
TOUCH INPUT

Figure 31

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US92/02510

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC(5): G07B 17/00
US CL : 364/478

II FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
U.S.	364/478, 464.02; 235/381

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	US, A, 4,024,380 (GUNN) 17 May 1977, See figure 6c, and columns 1-3.	1
Y	US, A, 4,598,810 (SHORE ET AL.) 08 July 1986, See column 1 objects of the invention.	1
Y	US, A, 4,803,348 (LOHREY ET AL.) 07 February 1989, See claim 26.	1
X	US, A, 4,825,053 (CAILLE) 25 April 1989, See column 4, lines 18-54.	1
X	US, A, 4,900,905 (PUSIC) 13 February 1990, See claims 1, 7, 11 and figure 2.	1
Y	US, A, 4,940,887 (SHENG-JUNG) 10 July 1990, See summary and column 5, lines 16-26.	1
X,P	US, A, 5,025,386 (PUSIC) 18 June 1991, See abstract and claims 1, 7, 12, 15).	1
Y,P	US, A, 5,065,000 (PUSIC) 12 November 1991, See invention summary.	1

* Special categories of cited documents: [10]

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
22 JUNE 1992	28 JUL 1992

International Searching Authority	Signature of Authorized Officer
ISA/US	PAUL P. GORDON

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